

# The IRON AGE

Vol. 159, No. 16

April 17, 1947

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Indexed in the Industrial Arts Index. Pub-  
lished every Thursday. Subscription Price  
North America, South America and U. S.  
Possessions, \$8; Foreign, \$15 per year.  
Single Copy, 35¢. Annual Review Number,  
\$2.00.

Cable Address. "Ironage" N. Y.

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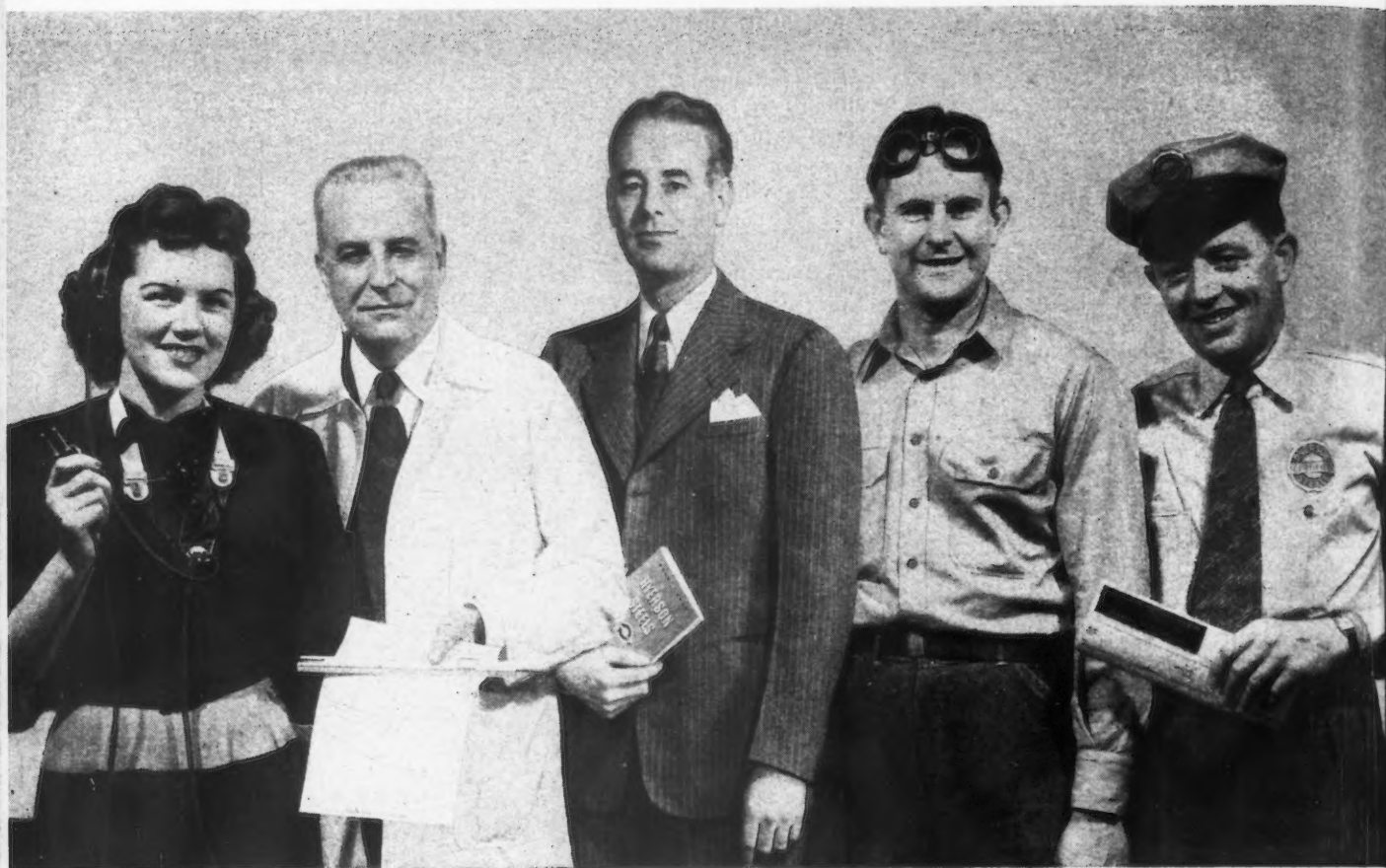
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## Of Stress and Strain

THE country seems haunted by specters—some half-seen at hand, some over the horizon and highly imaginative.

Production and employment are setting new highs. But, as the economic fabric heaves and pulsates, the national obsession is increasingly one of economic palliatives, all paraded in extravagant profusion and with the virulent intensity of seventeenth-century religious quarrels. There's none of the casual indifference of the 1920's—the era of wonderful nonsense—the era of high prices, high wages, lots of profits, lots of strikes, and plenty of isolation.

Cost of living remains high and tends higher; labor unions are on the march again to the tune of restrictive legislation; production pipelines disgorge at a record pace just as buying momentum sags; and the interplay of taxes, fiscal policies, foreign trade and political commitments of such complexity as to discourage the onlooker. The persistent search is for some ready answer, something like the precise computation of an elasticity modulus. Economic strains and stresses, however, do not lend themselves to such ready calculation, to a simple answer satisfying to all. The ebb and flow of argument and accusation are never ending—they are part of the democratic process.

Part of the confusion results from a chronic inability of many of the most vocal to view the situation as a whole and to define just what they are talking about.

Is the problem that of high cost of living? Then labor costs, management profits, distribution profits, government support of farm prices and withdrawals of commodities for foreign relief share responsibility. But bulking far above any of these individual factors is the vast increase in bank credit and currency through absorption of government bonds to pay for the war. While most of these inflationary factors have about run their course, there remains sufficient cumulative pressure to peg living costs near the present plateau.

Or the problem may be labor! The struggle of each individual to recapture a prewar standard of living will be persistent for years yet to come. Organized labor will likely enjoy relative success in this struggle; the great mass of unorganized will be at it for a decade or so.

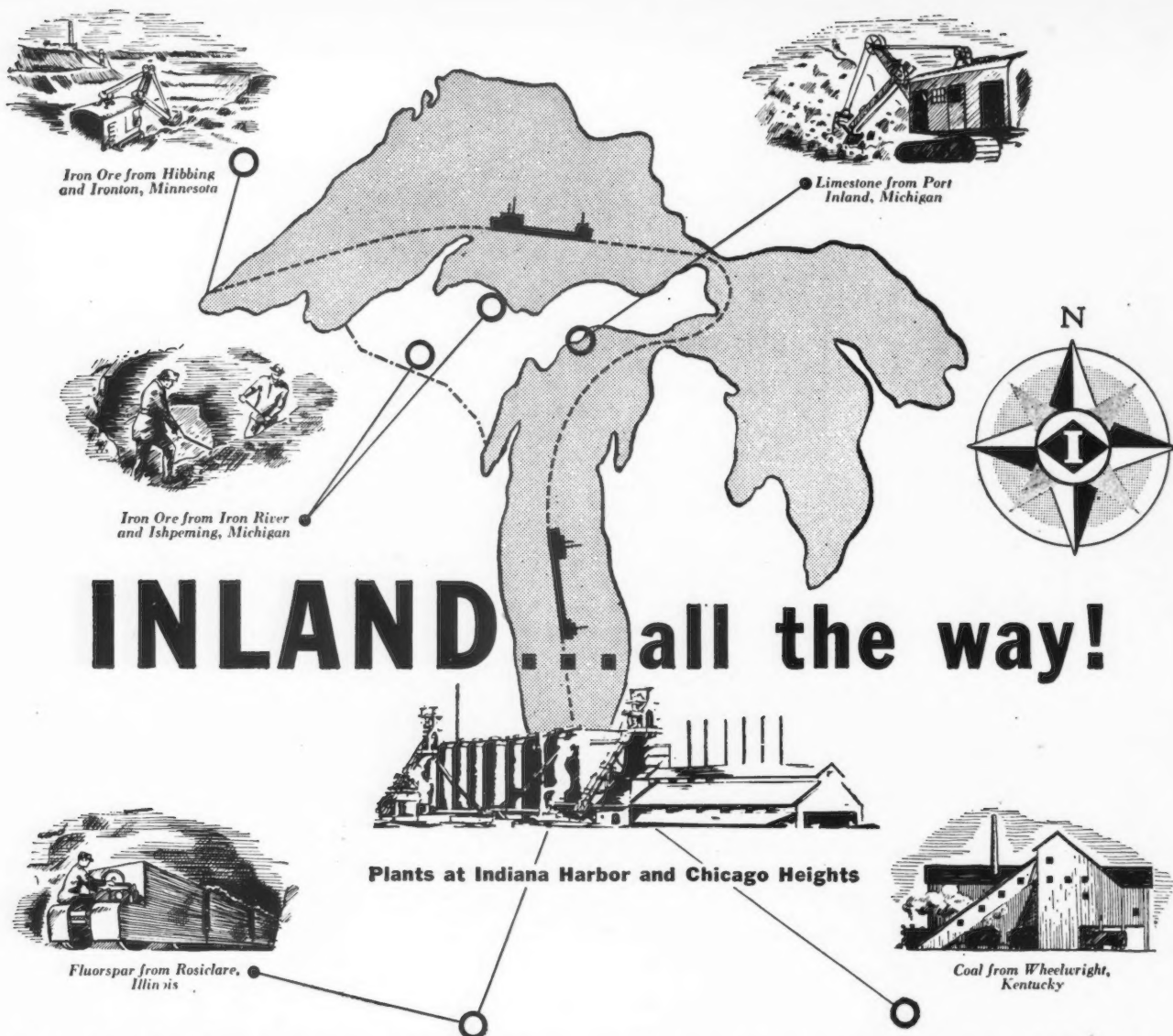
If the problem is profits, they will tend to fade as the struggles for markets take shape. Price reductions and full order books are not compatible.

Or, the problem may be one of world trade or world relief, foreign gold purchases, or support of the political Rimland against the Soviet Heartland. If these represent export of American products with no balancing import of foreign goods, the American standard of living suffers.

If the problem is taxes, the sword has two edges, both sharp. An unbalanced budget, being inflationary, lowers the standard of living; a balanced budget with retirement of the war debt, being deflationary, likewise has a depressive effect.

If the problem is the future and higher living standards for all, the answer is more and more efficient machinery, lower and lower power costs, patience, understanding and goodwill. There's quite a time interval involved. While the country is at it, a little less vocal extremism, a little less internecine warfare would benefit the collective nervous system.

*T. W. Lippett*



The making of steel comprises many elements and processes, among which the gathering of raw materials is of prime importance. The Inland map shows the many points from which we gather these raw materials in the Central States area.

The principal ingredient, iron ore, comes by Inland ore boats from the Mesabi and Cuyuna ranges in Minnesota and the Marquette and Menominee ranges in Michigan.

Port Inland furnishes limestone to serve as flux in the blast furnaces and open hearths. Because a ton of coke is required to make a ton of finished steel products, thousands of tons of coal arrive daily from Wheelwright, Kentucky.

Most significant, however, is the fact that Inland Steel owns the mines and quarries from which these

raw materials are taken... a fact which makes it possible to control quality from the raw materials to the finished steel—ready for use. This complete control from mine to consumer means—that the steel you buy bearing the famous diamond trademark, is... **INLAND ALL THE WAY!**

As with all fabricating materials, the demand for Inland steel now exceeds the supply. However, we are building new mills and expanding facilities that, we sincerely hope, will improve our steel deliveries in the future and eventually enable us to offer you all of the Inland steel you may require.

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► One complaint recently made by metal stampers to the Federal Trade Commission concerns withdrawal of some steel mills from distant markets because of unwillingness to absorb freight. The stampers assert they have been forced to switch to new and closer supply sources—sources with which they have little or no historical background. Result, say the stampers: they are far down on the list for access to tonnages at the new sources.

► By substituting aluminum for steel panels, a company making large truck-trailer bodies has eliminated 400 lb of weight. Its use for truck parts is also increasing. One midwest manufacturer now uses it for pistons, axle parts, transmission cases, brackets, hoods and doors. Eventually it may be used for truck cabs and wheels.

► To utilize West Coast facilities, an eastern manufacturer of heavy engines has been making heavy parts shipments of pistons and similar components to a western plant. But western manufacturers are re-examining the heavy freight charges involved in two-way transcontinental operations of this kind.

► Despite some opinion to the contrary it has been shown that saw cuts in stainless steel are accomplished by frictional heat alone.

► Sale of former government-owned coal and iron facilities in Texas, Oklahoma and Colorado opens the possibility of foundation of an industrial empire in the Southwest. Combined capacity of three properties recently sold or leased to private industry there is about 676,000 tons of pig iron and 976,000 tons of coke annually.

► A production line heat treating setup in a Canadian steel plant normalizes steel strip at speeds from 300 to 450 ft per min. Controlled atmosphere in the heating zone eliminates oxide and scale formation. Traveling loopers at each end of the cycle allow for welding one coil to another (at beginning of cycle) and punching out a small disc for hardness test (at end of cycle) without reducing production speed.

► The Linz blast furnaces of the Hermann Goering Werke in Austria, which had been closed down for lack of coal, are being relighted—with a guarantee of 700 tons of Ruhr coal a day, to the horror of the French steel industry.

► Many western diecasters are building their own diecasting equipment, which is generally neither as well designed nor as efficient as that produced by machinery manufacturers.

Western copper alloy diecasters operate at temperatures much higher than are common in the East and die life is shorter. However, they appear satisfied with some 3000 shots per die—compared with 5000 to 20,000 shots in proper tool steel dies at somewhat lower temperatures.

► Aluminum remelters are doing research to permit marketing secondary ingot suitable for rolling into wrought forms, but it will probably not be concluded and ready for the market for a year or two.

► Fractional hp motor production in England is reportedly 25 pct below capacity with one prime cause the shortage of labor, particularly female.

► Mercury is being used as an alloying addition in beryllium nickel copper alloys. Mercury contents of 0.15 to about 1 pct are employed to prevent the oxidation of beryllium both during melting and subsequent heat treating stages.

► Aluminum alloys formerly considered not forgable are now being formed by extrusion molding techniques. This process permits the manufacture of complicated shapes impossible to achieve in forging even in the most workable material.

► The first mock-up body for the Tucker Torpedo has been completed at the Cicero plant of Chicago's new automobile builder. Aluminum which was to be employed in some panels and B frame members will not be used. The body will now be entirely of steel.

► The strategic machine tool reserve has been in the doldrums according to a recent report that only 8000 tools have been packed and shipping instructions prepared for a mere 600. Indications are though, that the armed forces have been tagging machines at a rapid clip during the last few days and that the earmarked number is now well above 8000.



# Setting



Fig. 1 — The Multi-Source and spectrograph unit.

NUMEROUS articles have appeared recently discussing spectrographic applications in industry. From data published, indications are that American industry has recognized its applicability not only as an analytical tool for research of information and control for rapid determinations of various alloying elements, but also as a control over quality of materials entering into products of the manufacturer.

Installation at Continental Motors Corp. began in March 1945, and within a period of 40 days, the spectrograph had relieved the chemical laboratory from a large volume of routine work of analyzing incoming steel and cast iron from various sources, with a resultant saving of personnel and time. The apparatus (Applied Research Laboratories spectrographic equipment) consists of a standard grating instrument with an approximate dispersion of 7 Å per mm in the first order, designed for the use of a 35 mm film, adapted for 15 spectra.

For other articles on spectrographic analysis, see THE IRON AGE, Mar. 28, 1946, p. 42, Aug. 8, p. 50, and Aug. 15, 1946, p. 61.

The developing machine is of the agitating or rocking type with four trays to contain the solutions. A thermostat temperature set at 70°F controls the developer.

An infrared air dryer is used to dry the film. The densitometer, equipped with a master plate and com-

parator, is of the type which employs a motor driven scanning slit 12 microns wide and 1.1 mm long.

A GE motor generator with an automatic voltage regulator to give 0.5 pct voltage control was installed with the Multi-Source unit. The Multi-Source unit, which is being recognized as an all-purpose apparatus, is equipped with automatic circuit timers, meters, volt-

TABLE I

Conditions Used in the Analysis of Steel and Cast Iron

Source Conditions:

Source	ARL Multi-Source
Secondary peak voltage	940 v
Capacitance	2 microfarads
Inductance	25 microhenries
Resistance	1.4 ohms
Discharge point control	90°
Charge v. discharge switch	180°
Initiator type	High power continuous
Discharge type	Oscillating spark

Optical Conditions:

Slit width	.60 microns
Grating aperture	0.8 open
Lens	5 in. cylindrical

Discharge Conditions:

Upper electrode	Flat surface sample
Lower electrode	1/4 in. graphite rod, 120° cone
Spark gap	3 mm
Pre-exposure discharge	10 sec
Exposure	12 sec

Photographic Conditions:

Film	Eastman No. 1
Developer	D-19

# Up for Spectrographic Analysis . . .

age regulator and an oscillograph to show the pattern of the electrical discharge which has been selected by means of the switch banks. One can attain conditions of discharge which otherwise would be impossible by varying the adjustable banks of capacitors, inductance, and resistance. Arc-like or spark-like excitation conditions can be produced, thus controlling the sensitivity and accuracy desired (see fig. 1).

Since products, either rough or finished material, bar stock, or specimens of odd shape, were to be analyzed, a flat surface technique, being nondestructive, was employed. This method proved to be the most practical.<sup>1</sup>

Applying the spectrograph to the diverse types of unknown specimens and their complex metallurgical history presented a problem in determining the film characteristic. Unfortunately, reliance cannot be placed on calibrations made on one spot of the film; calibrations do not apply for different sections of the same film, because the film contrast changes with the wave length.<sup>2</sup> Since it was intended to cover the photography range of the spectrograph from 2200 to 4200A, methods for the film characteristic calibration proved to be cumbersome and unreliable when varied work necessitated frequent changes in the source conditions.

Sources of error remain even after an accurate method of producing a gamma curve has been evolved.<sup>3</sup> Brief procedures are required where a large volume of work is to be done. Therefore, considering the various factors, errors and other variables which cannot be controlled in the process and treatment of the film, and since the integrity of the results can be expected

**Based on the experiences encountered at his plant, the author indicates the fundamental concepts to be observed by a laboratory when installing a spectrograph unit. The effect of variations in barometric pressure in varying the slope of analytical curves is also explored herein, substantiated with experimental data.**

By P. J. GRUSZECKI

Chief Spectrographer,  
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Muskegon, Mich.

only for the middle range or the straight portion of the H v. D curve,<sup>4</sup> an arbitrary 45° straight line for the characteristic of the film was assumed, see fig. 2.

Analytical curves, once established by repeated checks, are produced by sparking a flat surface sample with an alloy of known concentration to determine the so-called "curve drift" or the variation of the analytical curves. Conditions used for the alloy determination of steel and cast iron are similar and are listed in table I. However, with the elimination of the calibration of the photographic film, certain restrictions should be pointed out in order to minimize any possible error.

The source conditions should be selected by use of the various switch banks of the Multi-Source unit to produce the transmitted alloy lines of the spectrum within the limits of the otherwise straight portion of the calibrated emulsion of the film. Experience and familiarity with the equipment has proven that the oscillating electrical discharge is most sensitive and accurate for this technique.

Fig. 2 illustrates the assumed line employing spectral transmission lines of density which fall on the solid portion. Providing the light source has reasonable stability, accuracy is obtained by producing and selecting a great number of line pairs of the approximate identical density between the internal standard line and the element line, and, those which respond or behave similarly, see tables II and III.

Uniform temperature, with an air conditioning unit, maintains a constant room temperature of 76° ± 2°F. This unit also controls the relative humidity to a low level of 35 ± 5 pct.

TABLE II

Spectral Line Pairs and Ranges for Steel

	Element	Reference	Range
Mn	2889.58	2889.09	0.25-0.50
	3441.89	3443.88	0.50-0.75
	2888.68	2888.09	0.75-1.00
	3474.13	3490.58	1.00-1.30
Si	2881.58	2912.15	0.20-0.40
Ni	2316.04	2322.33	0.20-0.40
	2316.04	2307.31	0.40-0.60
	2270.21	2287.59	0.60-1.10
	2278.77	2287.59	1.10-1.50
	2287.08	2287.59	1.50-2.00
Cr	3492.96	3493.47	2.00-3.00
	2862.57	2888.09	0.30-0.50
	2822.37	2806.98	0.50-0.75
	2822.37	2823.28	0.75-1.00
	3120.37	3083.74	1.00-1.30
V	3110.71	3091.58	0.10-0.15
	3102.30	3083.74	0.15-0.25
Mo	2816.15	2771.18	0.10-0.25
	2775.40	2772.11	0.25-0.75
Cu	3273.96	3286.76	0.10-0.30

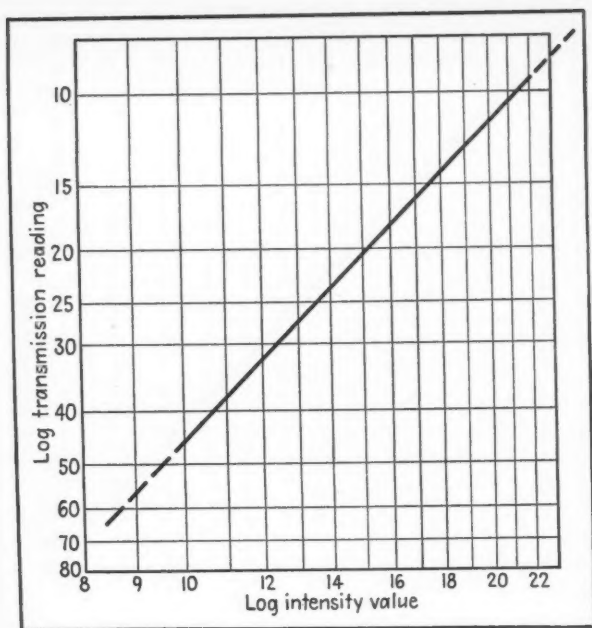


FIG. 2—Log transmission of deflection curve.

From a daily record of the barometric pressure, the cause of the elemental curve variation was conclusively established as the uncontrollable anathema in spectroscopy. From the gathered daily record, it was observed that if the barometric pressure indicated 74.0 cm or above, the plotted analytical curves remained normal and the standard values were reproduced on the established elemental work curves. When the pressure was lower than 74.0 cm, erratic results were obtained and it was necessary to reestablish the correction by sparking and plotting preferably at least, three different standards with known and various chemical values. This is not necessary for all the elements. The analytical curve for the element molybdenum was the most difficult to maintain, due to the lack of density of the spectral line. Better results were obtained with increased density.

The deflections caused by the barometric pressure are shown in fig. 3. The solid lines are always produced for the elements when the pressure is 74.0 cm or above; the broken lines vary with a lowering of the barometric pressure.

At the present time, white metal base alloys and aluminum alloys are also being analyzed spectrographically with an accuracy of 5 pct of the concen-

tration. The above accuracy was attained after having calibrated the analytical curves accordingly from sources of purchase. This was found necessary due to the metallurgical heterogeneity, composition and physical state of the various specimens.

In addition to the above metals and alloys analyzed, bronzes are being investigated to extend the spectrographic methods. The effect of one element on intensities of another is being experienced.<sup>5</sup> Also, the change of the sensitivity of the spectrum lines by an addition of another alloy is observed.<sup>6</sup>

The author desires to emphasize the simplicity of the method by employing the arbitrary 45° line for the gamma curve without impairing or sacrificing accuracy under many and various circumstances. It is

#### Acknowledgment

The author gratefully acknowledges the helpful assistance rendered by members of the chemical laboratory and the spectrographic department.

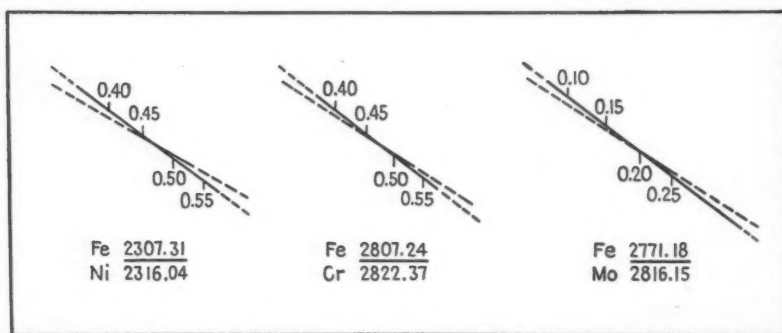
definitely applicable and possible to analyze successfully ferrous and nonferrous materials. This procedure is characterized by analyzing any type of material in a simple and straight forward manner without elaborate and painstaking calculation of the film characteristic. The only essential requisite is to select reference and element lines of approximate equal densities.

For constancy of accuracy and reproducibility it has

TABLE III  
Spectral Line Pairs and Ranges

	Element	Reference	Range
Mn.....	3441.99	3465.86	0.30-0.60
	2886.68	2806.98	0.60-1.00
Si.....	2881.58	2880.58	1.00-2.00
Ni.....	2316.04	2304.58	0.10-0.25
	2316.04	2307.31	0.25-0.60
	2270.21	2307.31	0.60-0.90
Cr.....	2877.16	2806.98	0.05-0.20
	2862.57	2888.09	0.20-0.35
	2822.37	2806.98	0.35-0.50
V.....	3093.11	3091.88	0.15-0.35
Mo.....	2816.15	2806.98	0.15-0.50
	2775.40	2806.98	0.50-0.90
	3132.59	3116.59	0.90-1.25
Cu.....	2246.99	2253.12	0.10-0.30
	2242.14	2253.12	0.30-0.80
	2179.40	2253.12	0.80-1.25
	2276.25	2253.12	1.25-1.80

FIG. 3—Effect of barometric pressure on deflection, represented by element curves produced as relative photographic exposures of two quantities, time and intensity, with known and varied chemical concentrations.



exceeded the author's hopes and it is his wish that this article will give confidence and encourage others to realize its possibilities and its application.

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# A Psychologist Looks At Management Problems

By J. WATSON WILSON

*Rohrer, Hibler & Replogle, New York*




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**Highlighting the development of the comparatively new science of human engineering is the growing appreciation of the effect of the state of the mental health of key plant personnel on a company's cost sheet. In this article, which touches on a new aspect of cost reduction, the author cites specific cases to demonstrate the effective use of applied psychology in improving the utilization of personnel on all levels.**

---

**B**USINESS can no longer ignore the general mental health of its employees, especially of its key executives. It is not necessary to be a psychologist to know that what people do is conditioned by how they feel, by their attitudes, interests, and abilities. What people do is in reality dependent on their general mental health. It was with this in mind that the president of a well-known company made the observation that the financial statement which he presents monthly to his board reflects the quality and quantity of the judgments of his employees, especially his key executives; it reflects the ability of his personnel to initiate action, and it reflects their skill in human relations. In reality, it reflects that state of their mental health.

The clinical psychologist is interested in helping individuals to live more effective, useful and happy lives. He knows that if his clients can achieve better personal, social, home and work adjustments, he will not be called upon to deal with the frustrations of the stockholders.

The psychologist worth his salt always starts at the top. He begins by evaluating you, or your boss, or your boss' boss. Beware of the man who is going to begin with the press operator, or the janitor, or the office boy, or your secretary.

Starting at the top is always difficult. It is difficult primarily because you, or your boss, or your boss' boss, always want to begin with the other person. If you are a generous soul, you may take

the magnanimous attitude that Mr. Other Person has problems and want to know how you can help him. More often, you will take the attitude that if someone would only do something about the behavior of others you would not have any problems. From the point of view of the clinical psychologist, however, you are your biggest problem, and the higher you are in the organization of your company, the more opportunity you have to get in your own way.

Because of this, the psychologist must begin at the top. He must examine your intellectual competency, your emotional stability, your skill in human relationships, your ability to organize and direct. Having uncovered your assets and liabilities in each of these fields, he must compare them with the requirements of the position which you now occupy; he must make a prediction with respect to your effectiveness in your present position as well as higher positions within the company. Finally, he must prescribe development which will enable you to grow in, and, perhaps, beyond your present position.

Developmental work becomes the heart of psychological work. What good is the diagnosis unless treatment is undertaken? What good does it do you to know your strengths if you don't know how to use them? What is accomplished by your knowing your limitations if no one will help you overcome them? The diagnosis may tell you what is wrong with your cost statement, but it will not help you

present a more favorable cost picture to the board of directors. Only developmental work over a period of time is going to do that.

One morning, not so long ago, the manager of a plant dropped into a psychologist's office to express appreciation for the psychologist's part in a savings of \$25,000. It developed that the afternoon before, the psychologist had a conference with a department head who was concerned over the attitude of certain office workers. A study of the situation uncovered the fact that the women involved were unhappy because they did not have enough to do, but the department head was reluctant to do anything about it because, in this particular plant, there was a certain prestige attached to having a large office staff at one's beck and call, even though the calls were few. Further, he was reluctant to admit that he could not keep them all busy. During the course of the conversation with the psychologist the department head realized that his own pride was the problem and not the attitude of the girls. Later in the day he unbent enough to discuss his new insight with another department head, and another, and still another. As a result of the discussions the department head had frank talks with the girls involved. They were encouraged to resign. It may be a little surprising, but, with one exception, the girls thanked their bosses for their frankness.

In a recent routine evaluation a fiery-eyed, badly organized, highly emotional plant superintendent begged the psychologist to recommend his removal.

*This article is based on a talk delivered by Dr. Wilson at a meeting of the New England district of the Pressed Metal Institute.*

Between tears and curses he admitted his incompetency to run a division of the company in which more than 1000 persons were employed. The day before, for example, he had been found by an associate in the empty cafeteria raving at an audience of tables and chairs about what he was going to do to those "so and sos" if they did not get a particular part fabricated. Two days before he had called all the members of one department together and showed them signed dismissal slips they would receive if production was not up to standard in 4 hr. Because of neurotic actions such as this, four of his foremen and one general foreman had resigned in a period of 2 weeks. Yet he was an intelligent person with 16 years of invaluable experience in the company.

Instead of recommending, as the man had requested, that he be removed, the psychologist recommended that he be given a 2 weeks vacation beginning that afternoon. Further, he decided that this man was frustrated because of unsolved problems. Rather than get rid of the man, a much better plan seemed to be that of helping him to solve the problems.

When the man returned to work, therapy was begun. First, the problems were isolated, defined, and classified as to importance. This particular man did not miss a bet. We have already noted his work problems. In addition, he was wrestling with home problems, social problems and health problems.

A predisposition to emotional instability underlaid his present difficulties. Home problems started this particular downward trend. It began with the usual housing problem. A miscarriage by his wife pyramided his anxiety and caused him to become physically, as well as emotionally, upset. This had

an adverse effect on his work. He made a critical error in his planning. Its correction cost the company 6 months of time and thousands of dollars. It was this mistake, as yet unknown to anyone but himself, which precipitated the emotional outburst in the office of the psychologist.

Before he and the psychologist became acquainted, he had already cost the company thousands of dollars. Had his problem not been uncovered at that time, he would have cost the company additional thousands. What is much more important, that man is now, 6 months later, one of the most able superintendents in that plant. He is still working with the psychologist, but he has already proved the prediction that he could be rehabilitated.

Here was a man of superior intellectual ability. Despite this, his judgments were unsound and the action which he initiated contributed to the frustrations of his associates and his subordinates. His problem was one of focusing his ability in a way which would enable him to solve problems rather than to be frustrated by them. He was emotionally unstable. His skill in human relations was momentarily a minus quantity. He was almost totally lacking insight. As a result, he was unable to administer a division of the company effectively. With the resolution of his problems, most of his emotional behavior disappeared. Clinical work with him is now directed toward helping him to develop insight, so that he will not again get himself into the emotional state which caused the difficulties.

An average department head, who was an unusually able man, lacked administrative ability and insight. Week after week he talked with the psychologist, but nothing much seemed to happen. Finally, one of his subordinates sought out the psychologist with a problem which he stated in the form of a question. "Did you ever go day after day trying to stretch an hour's work into a whole day?"

The resolution of this subordinate's problem demanded that something be done about his boss. It demanded, for example, that the boss relinquish some of the detail that was bogging down the department. It demanded that he delegate responsibility and that he give his subordinates an opportunity to go ahead. It demanded that he pay more attention to people and less attention to things.

A few days later at a meeting of top executives, the conversation turned to ways and means of recruiting more personnel. This gave the psychologist an opportunity to question whether the company needed to hire more men or whether it needed to use its present manpower more effectively. Being careful to omit names and department affiliations, the psychologist told of the incident and questioned how general the situation might be. On the basis of this incident, it was decided that each department head might well take stock.

The department head at whom the barb was directed saw himself for the first time. Accordingly, instead of hounding the personnel department for new men who would increase his budget nearly \$100,000, he sought help from the psychologist in developing his ability to organize and direct the work of others for maximum effectiveness. Over a period of time, he became an administrator rather than a detailist; a supervisor rather than a worker who acted as a bottleneck for the whole department.

Of all the judgments the executive must make, perhaps the most important and the most hazardous



is about people. This fact was ably brought out by an insurance company executive. Each year the company gives special recognition to its best salesmen. In one recent year a new salesman sold over \$1 million worth of insurance. He was appropriately praised, but no one remembered to recognize the man who recruited, selected, and trained the new salesman. Who made the greatest contribution to this company that year, the man who sold the \$1 million worth of insurance, or the man who picked the salesman, the man who made the judgment about him?

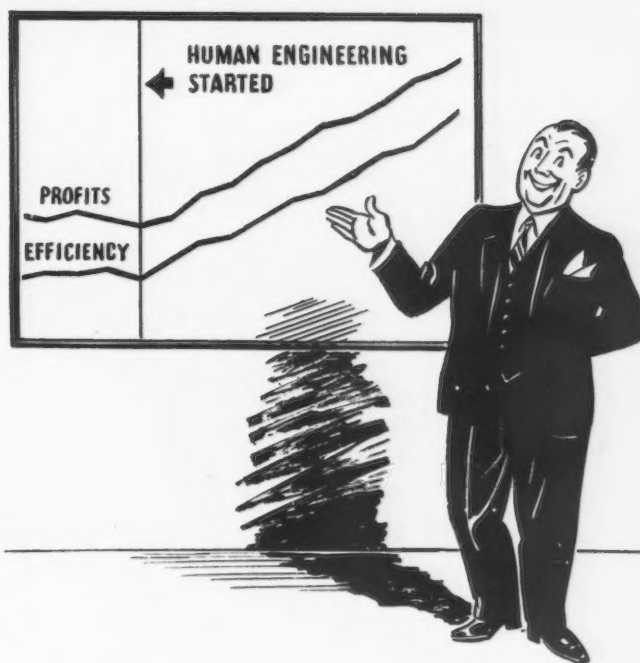
We all know the cost of labor turnover on the factory or shop level. Various studies have, for example, showed it to range between \$50 and \$500 for certain of the skilled trades. We do not know the cost of turnover in executive personnel, but are inclined to agree with the president of a company who, when confronted with the replacement of three junior executives, charged \$30,000 up to poor selection and placement. Because of these and other experiences, he will not allow any person whose salary is to be more than \$2400 per year to be hired without clinical examination by a psychologist.

Similarly, the president of a large national organization recently confessed that he has 50 men in the organization whom he does not know what to do with, men about whom he is unable to make adequate judgments. His interest in psychological assistance stems from his hope that these men, all of whom are in the upper salary classifications, may be helped to make more significant contributions to the company than is now the case. He is thinking of five and six figure savings when, and if, this can be accomplished.

A war plant which was organized in 1942 floundered until the early part of '43 when a new manager sought the assistance of psychologists in resolving the company's problems. Psychological work in this company was wide in scope. It included evaluation-developmental work, of the kind we have been discussing, with top executives. At the other extreme, it included work in recruiting, selecting, training, and placing factory help. Like all sound psychological work, it started at the top and fanned out as it permeated every aspect of the organization.

It produced the same product as three other plants. But, after a few months it produced the product at considerably less cost. It was the lowest cost producer despite the fact that it paid the highest wages of any plant making this particular product.

In a year, the year during which the psychologists did their most intensive work, manufacturing costs were reduced 10 pct; nonmanufacturing costs were reduced 33 1/3 pct; and sales costs were reduced 3 pct. During this period, profits before taxes were increased 250 pct, even after voluntary cash



refunds and price reductions of more than a third of a million dollars were made.

During these same hectic war years, labor turnover at all levels was reduced by two-thirds. Simultaneously, the overall efficiency of the plant increased from a bottom of 95 pct to a top of 175 pct.

There must be some relationship between the effective utilization of personnel on all levels and the cost of production. If the financial statement of the company reflects the quality and quantity of judgments made by its personnel (especially the key personnel), if the financial statement reflects the ability of executives and others to implement these judgments with dynamic, aggressive action, and if this same financial statement reflects the skill of the personnel in the handling of human relationships—as I believe it does; then, the psychologist has a financial contribution to make to any company.

He makes his greatest contribution by aiding the executives to improve their effectiveness in these areas. He does this, I believe, by helping them use their mental ability more effectively. He does it by assisting them to achieve more adequate emotional stability and control. He does it by aiding them to develop their skill in dealing with others in face-to-face situations. He does it by helping them to refine their skill in organizing and directing the activities of others. And, he does it by helping them to maintain their new effectiveness through the development of insight into their own behavior and that of others.

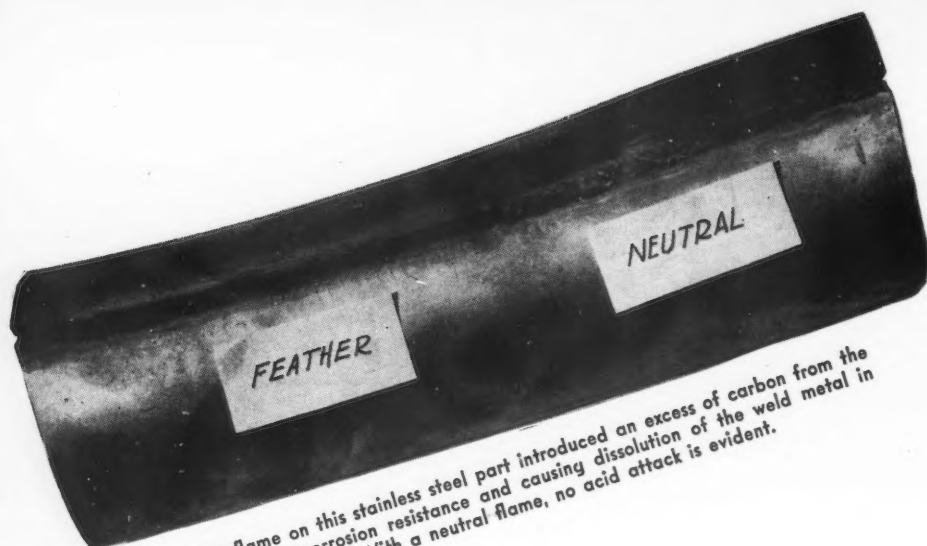
## Silicon Monoxide for Hardening Metal Films

**P**RODUCTION of experimental quantities of high purity silicon monoxide in granular form suitable for hardening evaporated metal films on glass to improve the abrasion resistant qualities of the metal film is reported by National Research Corp., Boston. A thin layer of silicon monoxide is evaporated

onto the metal film by high vacuum evaporation techniques. Subsequent heating of this film converts it to silica, resulting in a surface having approximately 100 times the abrasion resistance of an unprotected metal film. The reflectivity of the surface is said to be essentially unchanged.



# Causes and



Use of a feather flame on this stainless steel part introduced an excess of carbon from the acetylene, reducing the corrosion resistance and causing dissolution of the weld metal in the pickling bath. With a neutral flame, no acid attack is evident.

By FREDERICK S. DEVER

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**D**EFFECTS in welding can usually be traced to preventable faults in technique or procedure. For this reason welded fabrication should not be rejected on the drafting board any more than any other fabrication method when done by competent fabricators and high grade workmen. Ryan Aeronautical Co. has classified the defects that are most apt to occur in welding and has indicated how they may be identified and prevented. While this knowledge is most valuable to welders, welding department foremen and inspectors, design engineers find that familiarity with these production problems gives more assurance, when welded construction is desired, that satisfactory welded joints can be made if proper technique is applied. Recent developments in welding equipment also should give greater assurance of satisfactory welded joints, particularly where electronic or other automatic means of controlling welding heat and timing are used. It must be recognized in using such equipment, however, that these refinements in machines necessitate operator skill comparable to that required for fine machine tools.

The defects encountered in arcwelding, gaswelding, spotwelding, and special welding methods vary, and their correction involves different procedures. In arcwelding lap, fillet and butt joints the common defects are likely to be caused by poorly fitting the parts together, improper tack welding, lack of proper technique and application, or any combination of these. Metallic arcwelding defects have been classified in nine general groups.

(1) Burn-through, usually associated with lap welding, is defined as penetration exceeding 100 pct. This is sometimes not too serious. In 18-8 stainless steels, however, the oxidation produced destroys the heat and corrosion resistance of the metal, which is one reason for identifying burn-through as a defect. There may be one or several causes for this defect. A variation of welding speed to compensate for excessive gaps in poorly fitted parts will cause burn-through, because the heat input is excessive in these areas where a large amount of weld metal is required to fill the gaps in the joint. If voltage and

amperage are too high for the metal thickness being welded, the resulting excessive heat will cause burn-through. If the rate of travel or welding speed is too slow or erratic (fast and slow), burn-through may result. The angle at which the electrode is held may contribute in causing this defect. In tacking, the use of extreme heat setting may result in small burn-through areas or large tacks, which the welder must fuse when completing the weld.

(2) Overlap, often called a cold weld, is a defect characterized by lack of fusion between parent metal and weld metal. It is usually small in area. Overlaps may be caused by too low voltage or amperage, too fast travel of electrode, flux on tack welds, excessive scale on parts, flux from electrodes getting ahead of the weld metal deposit, peculiar flux action caused by incorrect angle of electrode, or by large cold tacks that do not fuse with the finish weld.

(3) Skips or omissions refer to incompleting welds at certain points. Improper positioning of a part to be welded can cause this defect, especially if the welder does not have a complete view of the weld area. Other causes are flux from tacks, or flux balling up during welding, erratic speed of electrode travel, poorly fitted parts, defective spotweld tacking, lack of care inside 90° corners, or poorly fluxed electrodes, which cause a wild or unstable arc. Also the welder may be affected by sudden disturbing noises, or his helmet lens may be too dark to give good vision of the weld puddle while depositing metal.

(4) Cracks are not characteristic of the metallic arc process when using 18-8 stabilized electrodes. This defect is more apt to occur in high carbon steels and alloy steels such as X4130 and 25-12 stainless, especially if the assembly contains heavy cross-sectional fittings or plate, or light tubes. Thermal stresses set up during welding are sufficient to cause cracks. The commonest causes of cracking in 18-8 stainless are excessive cold working of the material, including forming and bending, after welding; extremes in light to heavy gage combinations, which cause shrinkage stresses; incorrect welding proce-

# nd Prevention Of Welding Defects . . .

**Universally accepted as a standard method of joining metals, welding is, nevertheless, not foolproof, and unless properly performed is subject to defects which can usually be traced to preventable faults in technique or procedure. In this article, the author classifies the most frequently occurring defects and discusses the causes and methods of eliminating them.**

ture; and shear or tension loadings while the weld area is at 1200° to 1600° F, the hot short temperature.

(5) An undercut is a defect in which the weld metal deposit leaves a notch on one or both sides of the weld bead and is insufficient to fill the crater in the joint. Concentration of stresses in these notches is, of course, serious. There are four leading causes of undercuts. Excessive heat from the high amperage and voltage makes parent metal and weld metal too fluid, causing them to sag under the influence of gravity. If the rate of electrode travel is too fast, insufficient weld metal is left to fill the crater left by the heat of the arc. These two conditions should be coordinated to give adequate penetration and a well-rounded weld bead. Concentration of heat on one plate, resulting from electrode angle, causes undercut. Since the weld metal is fluid while being deposited, it will flow away from one plate, if the position of the work permits, and cause an undercut.

(6) Flux pockets and inclusions are defects that occur when the material is not clean. See fig. 1. Flux and oxides are either included in the weld metal or replace weld metal in some areas. Designs that have closed angles encourage flux pockets but they can be avoided by proper welding position. Too low welding heat prevents the flux becoming fluid enough to float on the surface of the weld metal. Large mis-shapen tacks may trap flux if insufficient care is taken to prevent this. When an electrode directs the arc ahead of the weld deposit, flux entrapment is encouraged.

(7) Poor starts and endings on welds are common, especially on short welds 1 or 2 in. long. Characteristics are large deposits at the start and insufficient weld metal at the end. This defect is usually the result of carelessness and can be prevented by correcting the heat range, using a voltage control rheostat for starting and ending the weld, and properly positioning the work.

(8) Excessive weld deposits, as

shown in fig. 2, result from several conditions or combination of conditions: Insufficient heat to fuse weld to parent metal, attempts to repair a burned hole or other defects, improper starting, large misshapen tack welds, failure to clean material, excessive weaving of electrode, and skipping back to cover an omission.

(9) Shallow weld deposits, when insufficient weld metal is deposited, do not always produce an undercut but leave the weld with insufficient strength. If the heat range is high, the rate of electrode travel must be fast enough to prevent excessive penetration, leaving insufficient weld metal. Too small diameter electrodes act similarly. These two factors must be coordinated. The use of a standard proven weld procedure cannot be overemphasized if uniform consistent welding is desired.

The major uses of oxyacetylene welding at Ryan Aeronautical are gas tacking and fusion welding of flanged seam-type joints. Defects that are described are based on these applications. A combination of conditions may cause defects. Four key points are uniformity in height of flange, width of weld, speed, and amount of filler rod. Gaswelding defects are classified into ten general groups.

(1) Excessive penetration is usually caused by too high a flange or addition of filler rod to a flange of

**FIG. 1**—Cutaway section of a stainless steel part showing poor fusion between the weld and the parent metal. This is a two-pass arcwelding job in which the flux left by the first weld was not cleanly removed.





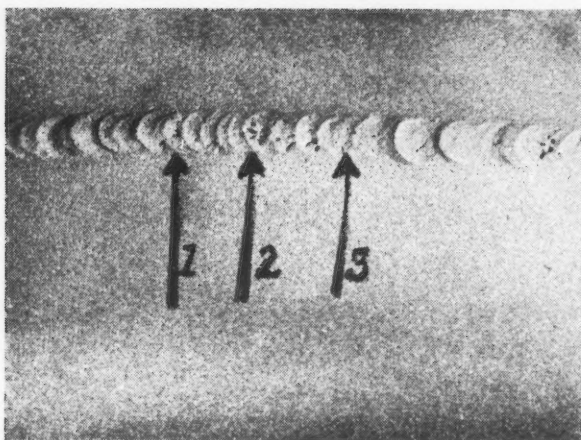


FIG. 3—Typical example of porosity in a gas flame seam weld caused by poor welding technique.

proper height. Excessive heat input requiring filler rod to bring weld height to proper level also contributes to this defect. Too slow welding speed, excessive weld width, and striving to produce a flat bead on the weld surface are also causes.

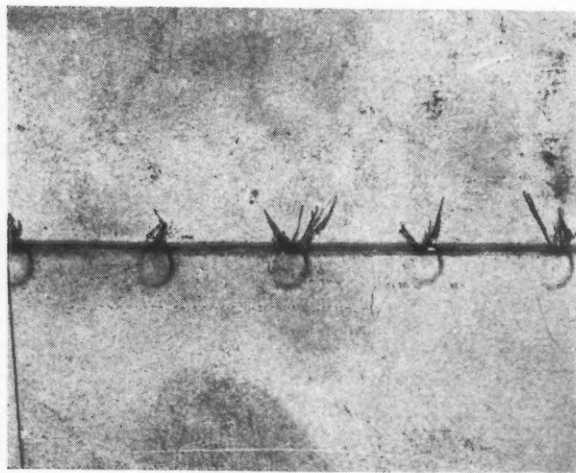
(2) Insufficient penetration, characterized by little or no reinforcing bead on the underside of the weld, is usually caused by low heat input, too great weld height, too fast weld speed, improperly applied flux, torch at too low an angle or improper weld motion, and dirty scaly metal.

(3) Undercuts are caused by too high heat input, too slow welding speed, insufficient flange or filler rod, too wide weld, and poor welding technique. This defect parallels excessive penetration since it is caused by the same conditions.

(4) Porosity, as indicated in fig. 3, makes a weld weak and brittle. Some 18-8 steels, particularly those stabilized by titanium, are susceptible to this condition. A smaller flame and tip and slower rate of travel are advantageous. Excessive puddling also induces porosity. Mild steels are usually free from this defect.

(5) Cracks may be caused by stresses set up by welding, or by cold work and forming after welding. Since oxyacetylene welding affects a larger area than arc or atomic hydrogen welding because it is slower,

FIG. 4—Row of poorly placed spot welds. Due to lack of edge distance, this member would fall far below the required strength specifications.



thermal stresses are greater. Parts held rigid by jigs and fixtures are more likely to crack upon cooling. Post heating in the area surrounding tack welds will, however, prevent cracking. Stabilized 18-8 steels are not as prone to crack as high alloy steels of the X4130 and 4140 groups. Insistence that parts be correctly and accurately fitted before welding will reduce the amount of cold working required, thus decreasing the number of cracks produced.

(6) Inclusions are not as common in oxyacetylene welding as in arcwelding. Dirty, scaly parts, the presence of oxidized material in the flame and on the weld rod, fluxed welding rod, and flux leaks into poorly fitted parts all produce this defect.

(7) Excessive weld width results only from poor welding technique and poorly fitted parts.

(8) Inconsistency, a defect characterized by a varied height and width of weld, usually results from poorly fitted parts, incorrect rate of welding, unevenly trimmed flanges, improperly positioned parts, part contour not properly aligned, and poorly tacked parts.

(9) Poor starts and endings are usually characterized by the burning away of parent metal on endings and large blobs of weld metal at the start, and are usually the result of inexperience or use of incorrect weld procedure.

(10) Mushroom penetration, where weld metal fails to bond at the edges, is not common because its usual cause is an unsuitable welding flux.

#### Atomic Hydrogen Welding Defects

In general, atomic hydrogen welds have the same defects as oxyacetylene welds, and for the same reasons. Since heat concentration is greater, the operator must pay closer attention, and some faults in techniques are more noticeable in this process. The rate of welding is faster than gaswelding and errors can occur faster. In addition to the normal defects noted in gaswelding, a defect known as warm holing may occur. This is caused by trapping of gases in the weld metal and can be prevented by reducing heat input and using a slow rate of welding.

#### Spotwelding Defects

Defects are allowed by most spotwelding specifications but are limited to 5 pct for structural and 10 pct for nonstructural spotwelds. Since not all defects can be found by visual inspection, other means are employed. Four general groups of causes are: Improper spotwelder setup; improper surface preparation; poorly fitted parts; and operator carelessness. Defects are of 16 types.

(1) Excessive indentation indicates too small electrode diameter or tip radius, excessive pressure or heat, or a combination of these factors with poorly cleaned surfaces and poorly fitted parts.

(2) Irregularly shaped spots indicate improper alignment and contour of tips, unsatisfactory surface preparation, and poorly fitted parts.

(3) Cracked or burnt spots indicate excessive heat or current dwell, excessive penetration, poorly cleaned surfaces, unsuitable electrode diameter or tip radius, excessive surface resistance caused by other than surface preparation, poorly fitted parts, internal or external splash, as defined in 6 and 7, or incorrect pressure.

(4) Spotwelds too close to the edge, as shown in



fig. 4, may result from lack of edge distance\* or operator carelessness.

(5) Low shear strength, barring defective welds, results from insufficient cross-sectional weld area. This indicates either low penetration (less than 20 pct of sheet thickness) or merely a too small diameter weld, which can be corrected by adjustment of machine variables. In rare instances insufficient

*\*Charts and methods of calculating correct edge distances for spotwelds were given in an article by the same author in the Jan. 30, 1947 issue of THE IRON AGE, p. 46.*

pressure may be the cause. Inconsistent shear strength creates a condition where weakening and failure of weaker spotwelds throw overloads on adjacent spotwelds, thus causing progressive failures.

(6) Surface or external splash is displaced or extruded parent metal, which weakens the spotweld. A number of conditions or combinations of incorrect conditions cause overheating, which makes the metal plastic through its entire thickness.

(7) Internal splash occurs at the bond as a result of a number of preventable and incorrect conditions that prevent the normal retention of weld metal in the area to be bonded.

(8) Excessive penetration (more than 80 pct of sheet thickness) weakens joints by reason of low tensile strength, rapid failure under vibration and fatigue in shear loading. Extreme stress concentration is caused around the weld spot. Excessive heat or weld time are the usual causes. Localization of heat by too small an electrode tip may be the cause.

(9) Excessive sheet separation is usually encountered in poorly fitted parts. The spotweld becomes a column joining the sheets. Pressure should be held long enough for the plastic metal to freeze. Adequately cooled electrodes aid in cooling the plastic metal.

(10) Insufficient penetration is indicated by too low shear strength. Spotwelds of correct diameter and shape usually have enough shear strength if penetration exceeds 20 pct of sheet thickness. Increase in heat range or weld time, or both, is the solution.

(11) Internal cracks, either parallel or perpendicular to the sheet, may be caused by too large electrode diameter, which produces a large cast structure and causes strains on cooling. Too short a hold time may release stresses before the plastic metal is strong enough to resist them.

(12) Porosity is usually found near the center of the cast area of the spotweld and is indicative of poor welding technique. It can be corrected by

proper surface preparation, machine settings, pressure, heat range and weld time.

(13) Weld inclusions are associated with poor surface preparation or lack of cleanliness.

(14) Surface inclusions are also associated with poor surface preparation and dirty, misaligned and overheated electrodes. Excessive pressure may also contribute to this defect.

(15) Incorrect spacing must be guarded against. The pattern of spotwelds should be designed to give certain joint efficiencies.\* If this pattern spacing is not maintained, joint strength is reduced. Care in maintaining proper spacing, as given by design, cannot be overemphasized.



FIG. 2—Rough appearing seam weld caused by the tack welds which preceded the seam welding. The tack welds were made too large and the seam welding spread over them to produce this poor appearance.

(16) Poor fit of parts results in spotwelds being left in tension, thus having from 0 to 25 pct of required shear strength. Good design for spotwelds demands that a tension loading is never permitted. Poor fits may also cause excessive sheet separation, internal splash, excessive indentation, distortion of the completed unit, inconsistent welds, and poor appearance.

Familiarity with welding defects and their causes can be used to advantage on the drafting board where parts can be designed to minimize some of the factors that are likely to cause difficulty in welding. Designers can indicate by dimensioning or notes the various requirements respecting welding quality, cleaning of surfaces, use of jigs or fixtures, penetration limits, spacing of spotwelds, or other conditions.

# Modified Isothermal Treatments Minimize

By O. E. BROWN

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Lynwood, Calif.

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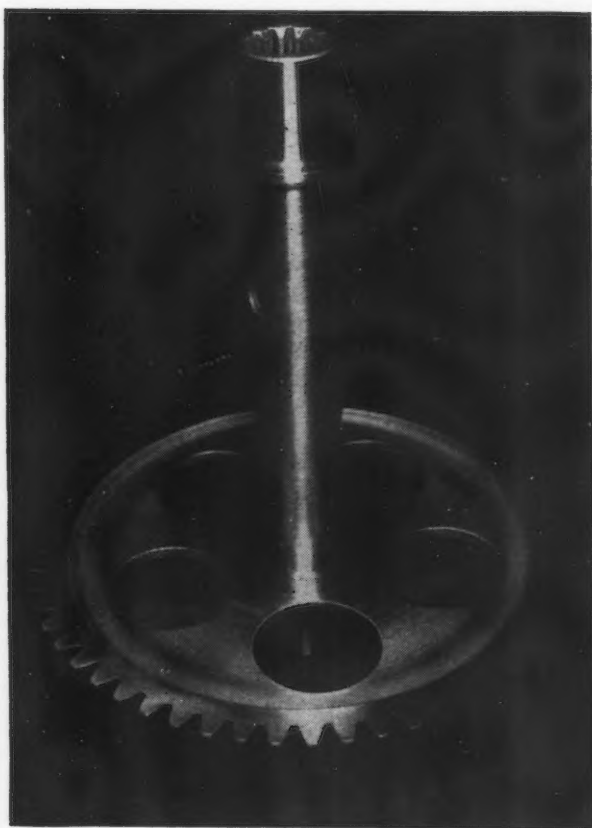
**Heat treatment cycles for two carburized nickel steel parts, a herringbone pinion and a gear having a light in all hollow shaft, are outlined herein. The isothermal treatments utilized, modifications of present conventional practice, have been successful in holding distortion to an exceptionally low value with no sacrifice in surface hardness. Core hardness has also been controlled without affecting the case.**

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MUCH of the production heat treating of today would have been regarded 10 years ago as both unnecessarily exact and economically impossible. Like many other sciences, the science of heat treatment reached new heights during World War II. After having obtained high quality work on aircraft and other precision parts during the war, manufacturers are no longer satisfied with 1937 standards.

One of the recent developments which has been

FIG. 2—Gear used for high speed, heavy duty.



applied successfully to production heat treating is so-called "isothermal quenching." The term is fairly descriptive, meaning literally, constant temperature. In practice it involves (1) quenching into a liquid, which is heated to a predetermined temperature; (2) holding (or agitating) in the liquid until the entire piece has attained the bath temperature, and (3) removing for cooling in air or some other medium.

Several advantages are obtained over the conventional quenching into oil, water, brine, etc.; the most important advantage is that of equalizing the temperature throughout the cross-section of the part before the structural change of the metal from austenite to martensite or some other hardened structure. Since the entire piece is caused to reach a condition suitable for austenite decomposition at very nearly the same instant, quenching strains are reduced to a minimum. This is reflected in a low tendency to distort. Isothermal quenching also produces nearly equal hardness in light and heavy sections. While there have been some who have felt that isothermal quenching often produced incomplete hardening, the process has been employed by an ever increasing number of manufacturers.

The purpose of this article is to indicate a new modification of the process, as well as to give an example of the excellent results which were obtained with a more conventional isothermal quench. Most such quenching has fallen under two general headings, martempering and austempering. In the former the temperature of the quenching bath is below the martensite point of the steel, which means that it is usually at 350° to 400°F except for a few steels, notably SAE 3312 whose M. point is 820°F. In austempering, the steel is held in the quenching bath for a protracted time. The treatment which is described below (for the gear) does not conform to either type of quench.

In the hardening of long, slender parts, three methods have been used in the past to obtain satisfactory results. (1) Quenching has been done in an open tank with parts being straightened afterward; (2) quenching has been performed in "egg-

# ze Distortion . . .

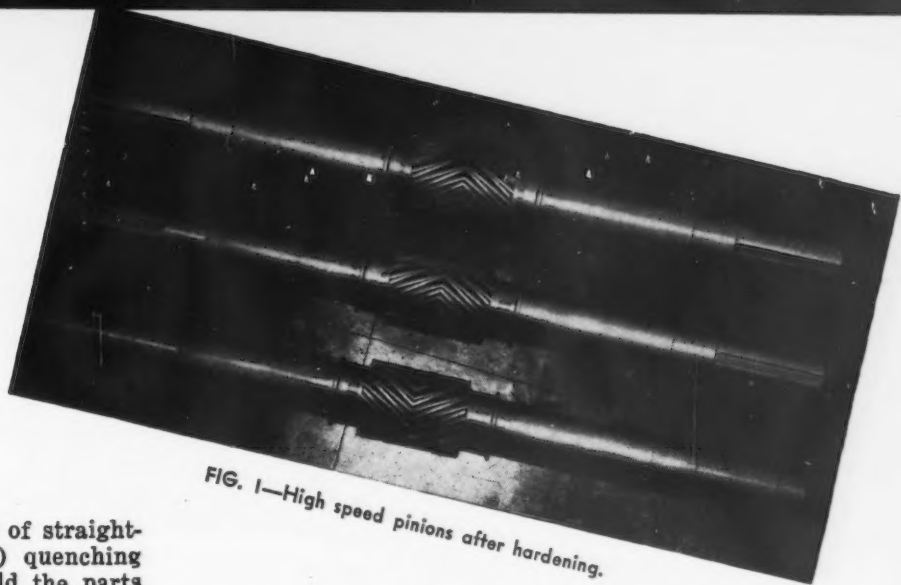


FIG. 1—High speed pinions after hardening.

crates" or "towers" so that the amount of straightening needed was greatly reduced; (3) quenching was done in a press in dies which held the parts so that no distortion could occur.

Obviously, the first method could not be tolerated on parts where fatigue or heavy duty were major items, since the straightening operation would introduce into the part stresses, substantially lessening its fatigue life and load-carrying ability. While the egg-crate with its controlled flow of quenching liquid and the tower with its flood of oil both have offered solutions to the distortion problem, they were both effective mainly with pieces of regular section. Use of the quenching press with suitable dies is very successful, but is limited to pieces short enough to fit into the press and to production where quantities are sufficient to amortize die costs.

In isothermal quenching one finds a process which can equal the precision of the press, is as cheap as the open tank followed by straightening, and can be applied successfully to a run of one part or ten thousand.

In fig. 1 is shown a group of long pinions which were subject to heat treating after machining. This was necessary because the specified hardness was greater than that which could be used to cut a herringbone gear. However, after being cut, it was of the utmost importance that the angle of the teeth remain constant and the shaft stay straight during hardening.

The pinions were made from SAE 4620 steel and were processed as follows; (1) bar stock rough

turned, (2) stress relieved at 1150°F, (3) finish-turned and teeth cut, (4) gas carburized at 1700°F, (5) quenched into salt at 400°F for 5 to 8 min. and (6) tempered at 300°F. Results of the treatment were: case hardness—62 to 64 Rc, core hardness—28 to 32 Rc, and distortion—not measurable on herringbone—about half of the shafts were within 0.002 in. Those with maximum distortion of 0.004 in. were straightened hot before tempering. At this stage the metal had not "set" and required low straightening pressures.

Quite a different type of problem was encountered in heat treating the gear shown in fig. 2. It will be noted that the web is light and the shaft hollow, with a very light wall. Obviously, straightening at any time after finish machining was out of the question. The problem was to harden with a minimum of 58 Rc surface and still maintain a machinable core. Being a heavily loaded high speed gear, it was made out of SAE 3312 steel. In this case the processing was somewhat unorthodox, since even the isothermal quench given above would have produced a core of 39 to 43 Rc, which could not be machined in the thin sections of this gear. The treatment was as follows; (1) SAE 3312 forging normalized, (2) rough machined, (3) stress relieved at 1200°F, (4) finish-cut teeth only, (5) gas carburize at 1700°F, (6) cool rapidly in atmosphere to 1450°F,

FIG. 3—Photomicrograph of SAE 3312 steel after quenching into a bath at 1000°F, from 1450°F, and air cooling; Nital etch. 200X.

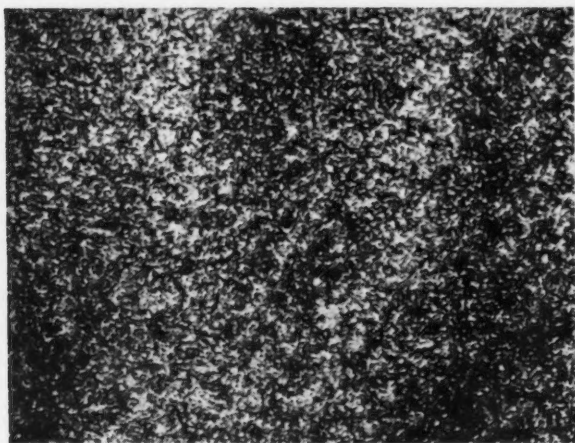
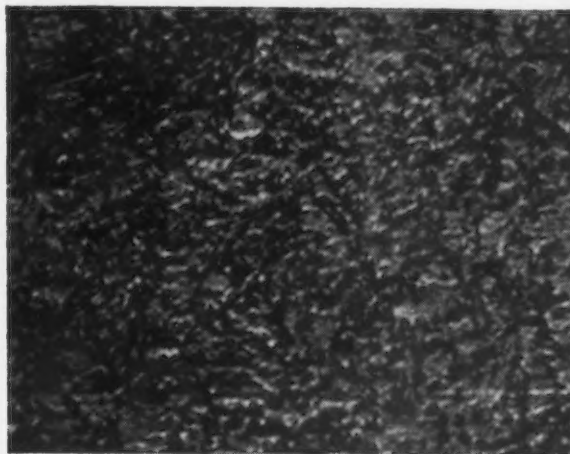


FIG. 4—Photomicrograph of SAE 3312 steel after quenching into a bath at 1000°F, from 1450°F, and air cooling; Nital etch. 2000X.





(7) quench from 1450°F into salt at 1000°F and hold for 3 to 5 min, (8) air cool and temper at 300°F, and (9) finish machine.

A check of the gear showed the following; case—61 to 63 RC, core—33 to 35 RC, distortion—from 0.000 to 0.0025 in., and machinability—satisfactory.

As shown in fig. 3 at 200 diam and fig. 4 at 2000 diam, a uniform microstructure was obtained in the core. The slight banding in fig. 3 is characteristic of SAE 3312 forgings. It was of considerable interest that high hardness resulted from an air quench after the isothermal quench. Since it is reasonable to expect that other alloy steels will also respond to this

type of treatment, a new field is opened in hardening without distortion.

In fairness to others who might wish to equal these results, it should be emphasized that the results of the hardening tend to reflect the care which has been exercised throughout in handling the parts. It should be noted that normalizing and stress-relieving has been employed to reduce or eliminate stresses which were in the forging or were produced in machining. In this way the parts reaching the hardening operation were free from stresses and structural unevenness which would offset the precautions taken to insure uniformity of quench.

## Attaching Carbide Parts by Threaded Inserts

**A**TACHMENT of carbide to other materials by means of screws or studs has long been considered desirable, particularly for larger pieces, but has been hitherto impracticable since carbide, in its hard state, cannot be drilled or tapped. This objection has now been overcome by a process of imbedding machinable inserts in the carbide parts at the various points where it is desired to drill and tap.

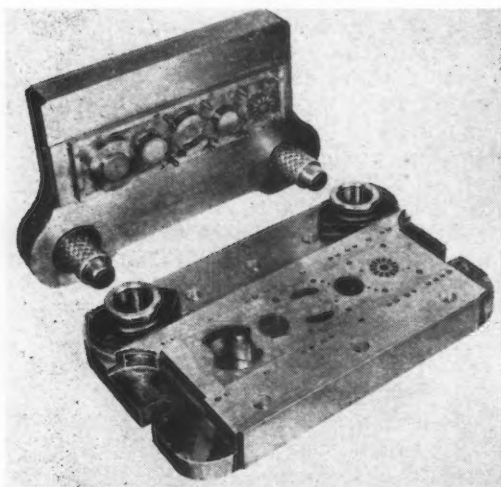


FIG. 1—Progressive lamination die in which the carbide inserts for the first three female members and the carbide punches for the first and third stages are attached by screws.

A particularly interesting feature of this development is that it makes possible the use of tapped blind holes in the attaching side of the carbide. This means that large wear surfaces may be bolted down rigidly, and yet present an unbroken working surface.

Developed by Carboloy Co., Inc., Detroit, the process is expected to open up new fields of carbide application by greatly simplifying design problems, and making it possible to employ carbides in locations otherwise impracticable because of the difficulty of attachment. The inserts are located at the approximate points of attachment during the manufacture of the carbide part and may be tapped to exact size and position either by the manufacturer or by the customer.

In dies, the ability to attach carbides with threaded

parts has the important additional advantage of permitting the carbide to seat solidly against the base, greatly increasing impact resistance as compared to attaching by brazing. Fig. 1 shows a 5-stage progressive lamination die in which the first, second and third female members are attached to the steel die block by the new Carboloy mechanical attachment method. The points of attachment are indicated by lighter spots on the illustration above the stud locations. The large carbide punch for the first stage and the two punches for the third stage are also attached by this method.

Again, where expansion problems are involved, attaching carbides with bolts provides additional advantages. For example, the holes in the support member may be countersunk and made slightly larger than the bolt diameter. The bolts can then be screwed into the threaded carbide and spring loaded. This insures firm seating of the carbide, yet allows for creep in case of differential expansion.

Other applications include such items as carbide

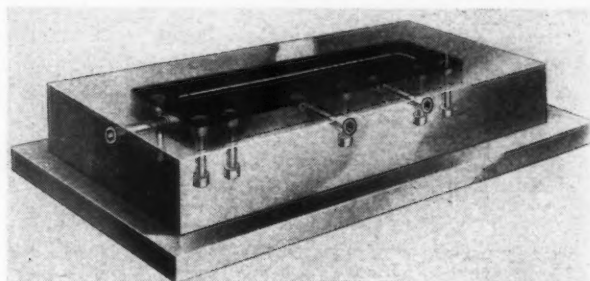


FIG. 2—Phantom view of a deep drawing die assembled from four sections of Carboloy, showing some of the attachment points. The carbide portion is over 12 in. long.

lined ceramic molds, wear surfaces on tools, fixtures and precision instruments, deep drawing dies such as that illustrated in fig. 2, crank guides, liners for mills, machine ways and guides, work rests, and in fact on any area subject to wear or abrasion. Large parts may be made in several sections if desired, and attached by any number of threaded holes. Small parts, as for example, replaceable solid carbide punch ends 5/16-in. OD and 3/8-in. thick can be applied by a single stud fitting into a blind hole.

# German Wartime Technical Developments

**R** EPORTS of German practice in numerous technical fields of interest to engineers and executives in the metalworking field, issued recently by the Office of Technical Services, Washington, are briefly described below. These reports are in addition to detailed articles of certain phases of German practice previously published in *THE IRON AGE*. Copies of the reports listed below may be obtained in either photostat or microfilm form, as indicated.

Orders for copies of these Reports should be addressed to Office of Technical Services, Department of Commerce, Washington 25, D. C., giving the "PB" identification number. See *THE IRON AGE*, June 27, p. 67, Aug. 29, p. 39, Sept. 26, p. 80, Oct. 10, p. 67, Nov. 14, 1946, p. 81, Jan. 9, 1947, p. 64, Jan. 16, p. 53 and Mar. 6, p. 70., for a list of earlier reports.

**Porcelain Enamel**—The German porcelain enamel industry maintained production during the war by substituting a vitrified sodium titanium silicate flux for borax and boron compounds according to this report on the porcelain enamel and ceramic color industry in Germany. The report reviews significant developments in the German ceramic industry and contains a compilation of German technical papers and formulas of value to the industry in the United States. *PB-40316; photostat \$5.00; microfilm \$2.00; 74 p.*

**Cutting and Flame Hardening**—Cutting machines for work on large plates, flame-hardening machines adaptable for special purposes and a blow pipe for deep, underwater metal cutting are developments in the German metal welding and cutting industry described in this report by H. R. Pufahl. American industry has no stationary cutting machines comparable in flexibility, adaptability, design and ruggedness of construction with the large size German machines, the investigator reports. *PB-40315; photostat \$6.00; microfilm \$2.00; 81 p.*

**Aluminum Industry**—Outstanding developments in the German aluminum industry include continuous casting methods and the manufacture of silumin, an Al-Si alloy made from clay, according to this report. *PB-31593; photostat \$9.00; microfilm \$3.00; 135 p.* Two other reports on German aluminum production available from OTS are *PB-44678; photostat, \$4.00; microfilm \$1.00; 48 p.* *PB-20540; photostat \$2.00; microfilm 50¢; 16 p.*

**Sintered Electrodes**—A sintering process developed in Germany for making electrodes for nickel-cadmium cells is described in this report. The process is said to make possible the production of an alkaline storage battery which discharges high currents without excessive voltage drop. *PB-34015; photostat \$4.00; microfilm \$2.00; 52 p.*

**Small Switching Engine**—A small switching engine capable of pulling or pushing jobs that would normally require a heavy locomotive is a German development described in this report. A feature of this engine is that it obtains its tractive force not from its own weight but from the weight of the cars to be moved. *PB-38161; photostat \$1.00; microfilm \$1.00; 6 p.*

**Zinc Smelting**—An analysis of zinc smelting practices in the American and British occupation zones in Germany is contained in this British report covering seven plants. The investigators conclude that German

zinc metallurgy was not of a particularly high standard. Nevertheless, the report contains data on production methods and costs of interest to British and American industry. *PB-27709; photostat \$14.00; microfilm \$5.00; 206 p.*

**Drop Forging**—Drop forging and other mass production methods are widely used in Germany for the manufacture of high quality surgical instruments, according to this British report which describes 15 German plants engaged in the manufacture of surgical and veterinary instruments. *PB-34019; photostat \$6.00; microfilm \$2.00; 77 p.*

**Pneumatic Tools**—A vast gap between the precise technical knowledge of German metallurgists and the application of metallurgical science to shop practices in the pneumatic tool industry is emphasized in this report by B. F. Sheperd covering 27 German plants manufacturing rock drills, compressors, pumps, valves and other accessories. His report presents information on employment, production, material specifications, heat treatment and shop practices at the individual plants. It also contains observations and comments on the general condition of the industry and ways in which it differs from its American counterpart. *PB-40314; photostat \$4.00; microfilm \$1.00; 50 p.*

**Powder Metallurgy**—Microfilms of five specially selected German books on powder metallurgy, metalworking and analysis are available. The text is in German. One book discusses powder metallurgy and sinter materials including high melting point metals. Aluminum and its alloys is the subject of two books. Another volume is a collection of monographs by 18 authors on various aspects of magnesium alloys. The fifth book, a text for students and metalworkers, provides special information and instruction in mathematical calculation and drawing. *PB-17653; microfilm \$6.00; enlarged prints \$127.00.* Individual books may also be selected.

**Plastics**—A comprehensive bibliography entitled "Plastics" comprising German and American plastics reports is available from OTS. More than 300 titles of reports issued up to Jan. 10, 1947, are listed. Many of the documents were acquired from the research files of I. G. Farbenindustrie by American investigators in Germany. Others are evaluations of American development processes and products. Mimeographed copies of the bibliography on "Plastics" will be sent free of charge upon request to the Reference Section of the office of Technical Services, Dept. of Commerce, Washington 25.



# • • • How to Use Carbide Cutters

By H. A. FROMMELT

*Consulting Engineer,  
Chicago*

IT is necessary at this point to discuss the term "life between grinds" to the end that reasonable agreement be arrived at concerning its interpretation, particularly in view of the changed conditions brought about by the introduction of carbide for the removal of metal. As it stands, the expression life between grinds is not sufficiently accurate or comprehensive. A discussion of a milling operation using both high speed steel and carbide, and for which the life figures are available, will make this contention clear.

An airplane wing hinge, of SAE 4340, heat treated to 42 Rc, was slotted originally with high speed steel. Carefully collected data showed that 11.2 hinges were milled between grinds with the best high speed steel cutters available. When carbide replaced the high speed steel cutter in the form of a solid carbide blade mechanically held, the life between grinds increased to 75 hinge slots.

The production rate with high speed steel was 10

for an 8-hr period; with carbide it was 100 for the same time period. Obviously the story regarding life is only half told when reported as 11.2 and 75 for high speed steel and carbide respectively. It is suggested, therefore, that a more accurate yardstick be used such as: The high speed steel cutter life is 11.2 hinge slots between grinds at a production rate of 1.25 per hr; the carbide cutter life is 75 hinge slots between grinds at a production rate of 12.5 per hr.

If the production rate using carbide on the above hinge job had been reduced to 50 per 8-hr day, with an increase over the former operation of 400 pct or 40 hinges, the cutter life could have been increased to 150 between grinds. But a high production rate on this essential item was a prime necessity; hence the justification for sacrificing optimum though not economical cutter life.

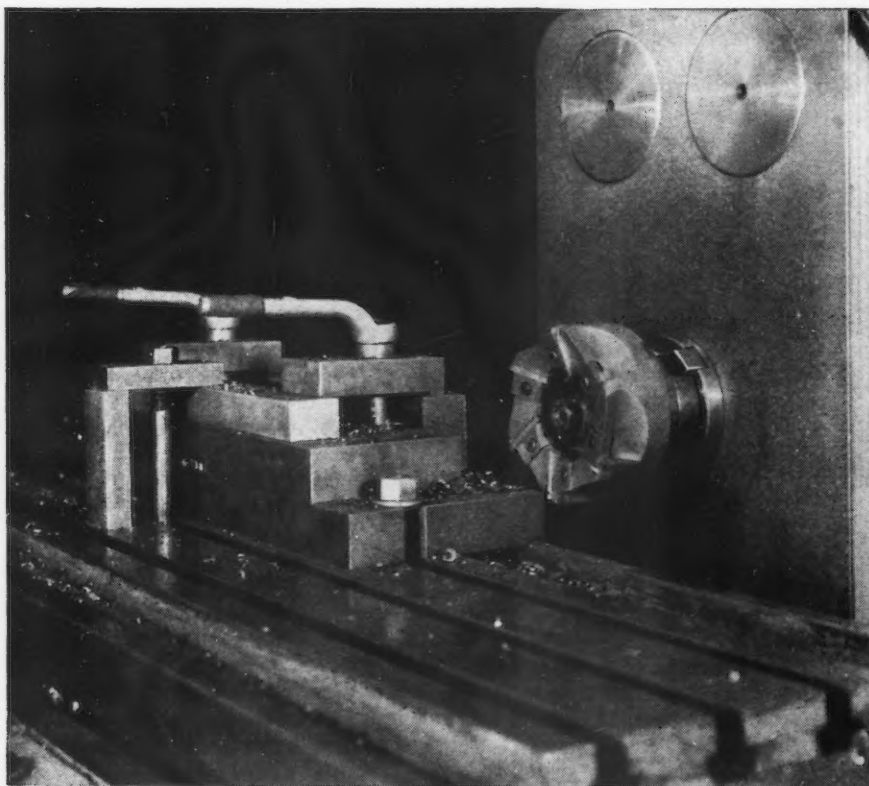
For there is such a thing as an uneconomical cutter life even though the pieces between grinds with carbide are greater than with high speed steel. For example, if only 25 hinges were obtained with a carbide slotting cutter and the production rate were 12.5 per hr, the setup must have been disassembled every 2 hr. This means a down time of approximately 1 hr out of every 3, or 2½ hr out of every 8-hr period, leaving only 5½ productive hours. Hence the total carbide production in an 8-hr shift would have been slightly over 60. While this still represents a worthwhile setup from 9 (taking into account the downtime in an 8-hr period with high speed steel), it is conceivable that lower life between grinds will result in an uneconomical setup for carbide operation.

The various factors that affect cutter life and that were discussed in the previous article will now be considered in the light of some everyday milling operations.

## Pole Pieces

The operation, shown in fig. 52, on motor pole pieces provides an interesting example of the influence of the various fac-

FIG. 52—Motor pole pieces milled on this standard 15-hp horizontal machine can be produced at the rate of 15 per hr with a life of 150 pieces per cutter grind.





# ers for Milling

... Regulating Life Between Grinds

... Cutter Design

... Grinding Cutters

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**In applying carbides to the milling process the total number of pieces obtainable between grinds is not necessarily the only criterion by which the economics should be judged. Hourly production must also be considered, and in case of need optimum life may be partially sacrificed to production demands. Some practical applications of the factors governing cutter life are considered herein, the ninth article of a series covering carbide milling, together with information on cutter design, types of blades, and grinding technique.**

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tors, such as the machine, cutter workpiece and carbide grade on this important end result referred to as life.

As is evident from fig. 52 a 6-in. face mill having six solid carbide blades was used to mill the face of these low carbon poles approximately 2x3x16 in. to a depth of 0.060 in. This operation was performed on a 15-hp horizontal milling machine without benefit of a flywheel. Nevertheless, an average of 150 pole pieces was milled (one side 3x16 in.) between grinds at a production rate of 15 per hr. The carbide grade selected for this operation was K3H.

When this same operation was performed on a 50 CSM Milwaukee machine, which is specially designed and engineered for carbide milling, having a built-in 340-lb flywheel, the life was 250 and the production rate was 30 per hr. (All production rates are given in floor-to-floor time.) The effect of a smooth flow of power to the spindle as supplied by the flywheel, as well as the greater rigidity in the larger milling ma-

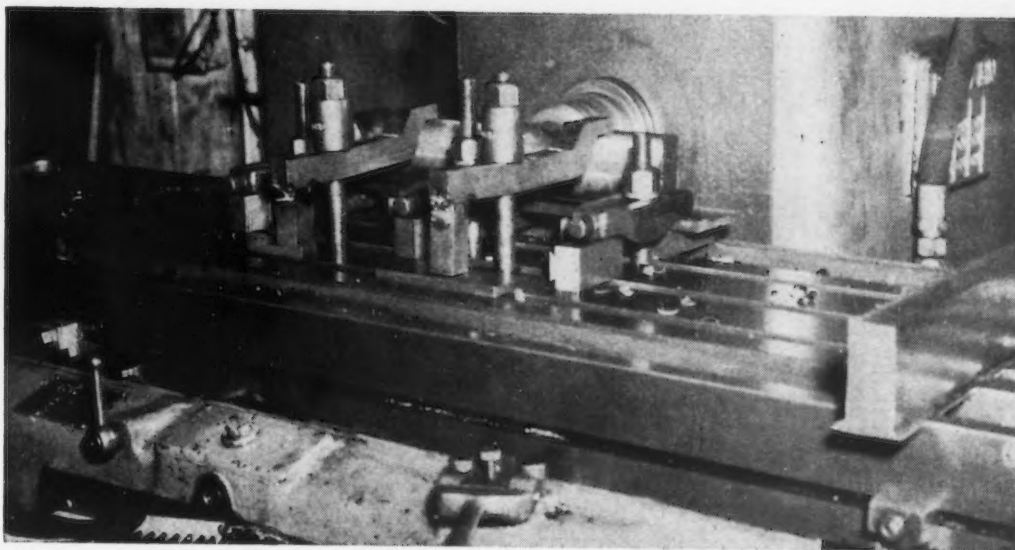
chine is immediately reflected in this striking increase in the solid blade life.

When the operation on the same pole pieces was the shoulder cut shown in fig. 53 the pieces between grinds dropped appreciably. This cut was 0.311x2.750x16 in. and was taken at 15 ipm in order to keep the power within the motor capacity of 15 hp. This represented a chip load of approximately 0.010 in. The metal removal rate was approximately 15 cu in. per min which on a standard machine increased the vibration factor, so much so that the grade of carbide was changed to KM, providing greater strength and therefore less chipping in face of the greater vibration in the setup. KM does not have the wear resistance of K3H; hence it was necessary to balance these grade specifications one against the other to determine the most suitable for the circumstances prevailing. K3H has great wear resistance to the chip flowing over the cutting edge, but less strength when subjected to the impact blows that come with vibrations in the machine, workpiece

o o o

**FIG. 53—**When the motor pole pieces were milled to a shoulder as shown here, cutter life dropped to 50 per grind because vibration necessitated a change to a carbide grade more resistant to vibration but with less wear resistance.

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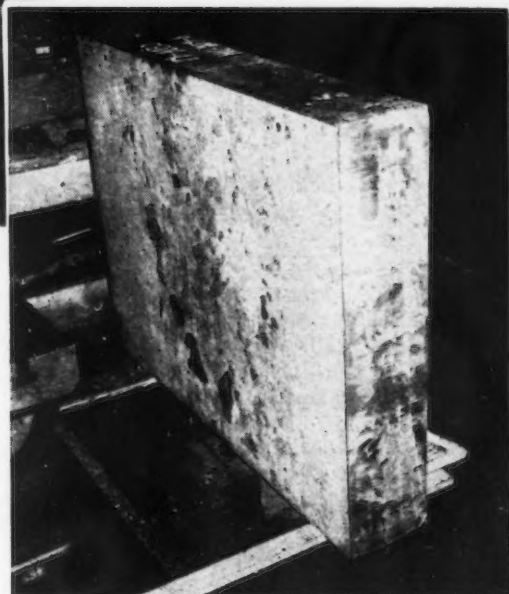
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**FIG. 54**—Even with well designed and rigid holding fixtures, parts of relatively flimsy construction cannot be milled at the same rate of metal removal as solid, chunky specimens.

o o o

BELOW

**FIG. 55**—On die blocks, such as that shown here, carbide milling will reduce machine time as much as 75 pct as compared with planing.



or cutter. KM, on the other hand, has less wear resistance to chip flow and action, but great strength against the hammer blows of vibration. In the pole piece job just referred to, the greater strength of KM grade won out against the greater wear resistance of K3H.

The cutter life for the shoulder cut discussed above averaged 50. This, no doubt, could be more than doubled if performed on a machine designed for carbide operation. In fact experimental runs on the 50 CSM referred to previously corroborate this statement.

#### Airplane Wing Hinge

Slotting a wing hinge, as shown in fig. 30 (Part 4, Mar. 6, 1947) involves the use of an 8-in. diam slotting cutter for the following reasons. The slot is approximately 10 in. long by 0.505 in. wide. If a plunge cut were attempted (with the center line of the cutter in line with the top of the wing hinge), the cutter diameter must then be approximately 24 in. With a cutter body 0.490 in. thick this disproportionate diameter dimension would have not only presented problems, but also practically insurmountable design difficulties. Hence an 8-in. slotter was used necessitating setting the cutter above the hinge surface approximately  $2\frac{1}{2}$  in. for the necessary clearance.

The relationship between the cutter and the workpiece changed the entrance angle of the solid carbide blades to  $22^\circ$  positive in spite of the fact that the radial rake angle designed into this cutter was  $15^\circ$  negative. In other words, if the cutter and hinge surface were in line, the entrance angle of the slotting blades would have been  $15^\circ$  negative. The positive entrance angle subjected these blades to a terrific impact blow the instant the blades entered the SAE 4340 forging heat treated to 42 Rc.

The difference in cutter life with this positive entrance angle was as much as 50 pct. Instead of 75 hinge slots between grinds with a production rate of

100 per 8-hr period the life would have been increased to 150, conservatively estimated. The influence of the workpiece setup (its relationship to the cutter) is here strikingly emphasized.

#### Airplane Strut

The influence of the inherent nature of the workpiece, referring to such characteristics as stiffness, rigidity, etc., on cutter life is clearly evident from a discussion of the operation shown in fig. 54. The nature of this component is revealed by the illustration; its thin sections made into a weldment whose prime requisite is strength with lightness. The difficulty of holding this X-shaped workpiece will be readily appreciated.

The relative reduction in cutter life as compared with a similar operation removing the same number of cubic inches per minute from a solid component is very considerable and unmistakable. For the operation shown here 900 cu in. were removed between grinds; for an operation in which the same material (and heat treatment) was milled from a solid block, 3000 cu in. were removed before grinding was called for.

Yet this life is optimum for the setup shown in fig. 54. An excellently designed fixture provided the maximum of rigidity for this relatively flimsy work-



piece. It would be incorrect to evaluate this operation—in terms of life—by the results obtained on a solid block. Hence the necessity for the application of good judgment when interpreting carbide operations; otherwise an adverse decision will prevent a conversion to carbide with its many benefits.

### Die Blocks

Die blocks, one of which is shown in fig. 55, were machined by the time-consuming planer method until the technique of matching carbide cuts was developed for the machining and finishing of large areas such as usually characterize back-up blocks for dies.

This steel forging was carbide milled with an 8-in. diam, eight-tooth cutter and the operation performed on a horizontal machine. The usual feeds and speeds for the milling of steel with carbide were employed on this job, namely 500 sfm at 20 ipm, and a chip load of 0.010 in. This metal removal method reduced the time to machine the surface by approximately 75 pct as compared with the planer.

For successful milling of a surface as shown in fig. 55, it is essential that the face clearance angle be 15°. The OD clearance angle is 7°, but this is not considered as critical as that of the face. Indeed, experience proves that unless this face clearance angle is 15° the cutter life will diminish to the point where carbide milling is uneconomical. In fact, with this clearance angle the life is three times that with a 7° angle. In addition, however, it is essential from a cutter life standpoint that a 45° corner angle be used with a 1/8-in. radius at the corner, or between the OD and the cutting face of the blade.

All other characteristics are secondary in importance in their effects upon life. Thus a change in the cutting angles, both radial and axial, within reasonable limits, will not change the life results in the least. But a slight change in the clearance angle on the cutting face of the blade will immediately reduce the cubic inches that are removed between grinds, provided, of course, that this clearance angle is reduced in size.

There is an additional interesting point to be given careful consideration in an operation of this nature in order to effect optimum wear qualities in the carbide blades. The general rule for the milling of a surface clean, as regards cutter size, is to apply the ratio of 8:5. Thus when milling a 5-in. wide work-piece face, the cutter should have an 8-in. diam. In this operation an 8-in. cutter is used as previously noted. But the width of the faces or passes taken at each cut is not greater than 4 in. This is an important, and even critical dimension, from the standpoint of cutter life.

The reason for the importance of this dimension is as follows: If the length of the chip is such that the cutter cannot conveniently digest it in the chip clearance space, then the chips will interfere by taking a free ride, thus adding to the abrasion and friction to which the blade is subjected, and also to a deterioration of the surface condition. The latter is usually associated with

### Previous articles in this series covering carbide milling were as follows:

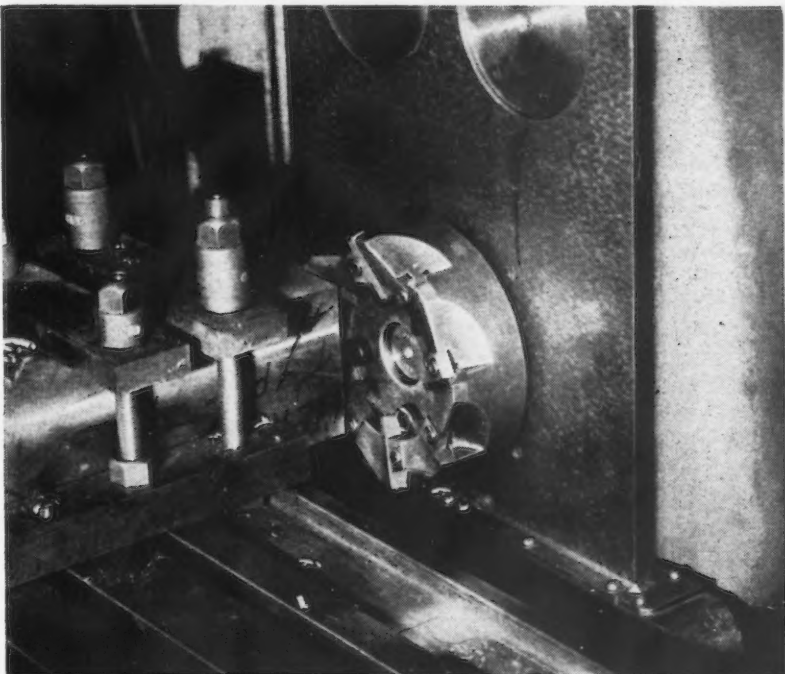
Part No.	Subject	Issue Date
1	Fundamentals of Carbide Milling.....	Feb. 13, 1947
2	Low Carbon Steel and Wrought Iron.....	Feb. 20, 1947
3	Straight Carbon and Cast Steel.....	Feb. 27, 1947
4	Heat-Treated Steel .....	Mar. 6, 1947
5	Armor Plate, Heat-Treated Alloy Steel, Stress Proof Steel and Die Plates.....	Mar. 13, 1947
6	Stainless Steels .....	Mar. 20, 1947
7	Semisteel, Alloy Cast Iron and Ni-Resist.....	Mar. 27, 1947
8	Factors Governing Cutter Life and Selecting Feed Rates.....	Apr. 10, 1947

lessened cutter life since it is the inevitable result of a blade or blades not properly removing metal or, above all else, to chip interference.

Thus it becomes necessary when milling to a shoulder, as is done in the die block job, (except for the last pass) to reduce the width of the cut to 3½ or 4 in. max. Thus the overall length of the chip including that portion along the radius is not so great as to result in troublesome interference. The same length chip if tightly coiled will be properly ejected from the chip clearance space early in its travels. In this way it will not subject the carbide blade to additional friction and abrasion—carbide's worst enemies. If the cutting land (referred to as the K-land) is increased in width, the chips will be coiled tighter, eliminated more easily and thus carbide life will be increased.

The K-land should, for ordinary purposes and average cuts, be ground approximately to 1½ times the chip thickness. Thus if a 0.010-in. chip thickness is being milled, the K-land is ground to between 0.015 and 0.020 in. Theoretically, it need be but 50 pct greater than the thickness of the chip, since metal in a milled chip is compressed in the process of being removed, and likewise its length is reduced proportionately. But to insure an adequate K-land width when

FIG. 56—The radial type of cutter in which the blades are set radial to the axis is generally preferred, and will yield greater overall life.





the feed rate is increased for any reason, the increase in the K-land is usually as much as 100 pct.

If now this K-land width is stepped up to as much as two and three times or 0.040 to 0.060 in. in width, then the chip will be coiled tighter, resulting in decreased chip interference and correspondingly greater life.

Cutter design, particularly as regards such specifications as clearance angles and K-land widths, plays an important part in cutter life.

#### Cutter Design

The cutter shown in fig. 56 which is of the radial design, that is, the blades are set radially, will yield considerably greater life than the cutter shown in fig. 57 which is of the axial family, that is, the latter design places the blades axially. The reasons for this



FIG. 57—Axial type of cutter which, while having good cutting characteristics, necessitates the waste of considerable carbide in the sharpening process.

increase may be summed up by saying that the radial design holds the blades more firmly and rigidly, since the turning moment tending to revolve them about their axis is greatly reduced in the radial as against the axial. There are additional and even stronger reasons for the use of the former design, and since they have considerable bearing on life, they will be properly discussed at this point.

In the radial cutter, with a dish angle of 15° the proportional projection as the blade is moved outward compensates for the wear of the blade. In milling, the wear of a blade, regardless of its specification, whether high speed steel or carbide, is three times greater on the OD than on the face. This is to be expected since the workpiece is fed into the cutter, leaving the OD of the blade to carry the larger share of the burden of metal removal while the cutting face merely acts to clean up the milled surface.

Hence, with the blade set radially and on a 15° dish angle, the blade moves upward one unit on the face and three units on the OD as it is moved outward to compensate for wear. And since the wear is three times greater on the OD than on the face, this proportional projection provides the most economical use of the carbide blade.

On the other hand, when the blade is set axially at

a 15° angle, moving the blade downward results in three units' extension on the face with only one unit extension on the OD. But since wear is three times greater on the OD than on the face, it becomes necessary to extend the blade excessively—three times more than would be required by wear—in order to get the proper blade extension on the OD for the removal of the wear by grinding. Axially set blades are uneconomically ground away on the face merely to keep them in proper relation with the OD. In other words good carbide is removed on the face that otherwise would be usable for the important business of removing metal.

#### Types of Blades

The current arguments revolving around mechanically held blades v. the brazed tip cutter need not be accentuated in this exposition. The brazed tip, whether on a solid body or in the form of a tip brazed to a shank, has its definite place in carbide milling. The brazed cutter will yield comparable life results with a design using mechanically held blades when the chip load is relatively light. Experience indicates, however, that when the chip load is increased above 0.010 in. this design is much inclined to chip and crack, whereas the mechanically held blade has been used successfully with chip loads as high as 0.050 in. This latter bite is impossible for the brazed tip. The physical facts are inescapable: Steel contracts approximately twice as much as carbide when passing from brazing to normal temperatures. Thus the brazed tip is placed in tension for which carbide has little or no appreciable strength. This results in an early chipping or cracking when subjected to the heavy chip loads possible with the mechanically held blade that has its pristine strength and is unspoiled by any forces resulting from the unequal contraction and expansion between steel and carbide.

Aside from these considerations, however, it is well to add that the economies resulting from the mechanically held blade design are so noteworthy they cannot be brushed aside. From daily experience it is clear that in the grinding of cutters, this design is far superior since the diamond wheel comes in contact with carbide only and not with steel. The latter loads the wheel, making for greater friction, more heat and hence increased possibilities of damage to the carbide from thermal shock.

Grinding technique plays an important part in carbide and, therefore, cutter life. Only a diamond wheel should be used and a diamond wheel of proper specification, lest damage be done to the carbides, particularly the steel cutting grades.

All of the steel cutting grades of carbide are harder on the Moh scale than silicon carbide which is the abrasive in the so-called green wheels. Hence, if the latter are used, the carbide is removed not by sharp, clean cutting but rather by friction and rubbing. This results in a localized heating and brazing of the surface due to the unequal expansion of the surface and the core of the carbide.

Moreover, a bond other than a metal bond is indicated. The preferred, according to experience, is the seramide bond wheel, a modified vitrified bond. Here there is sufficient rigidity to hold the diamond particles adequately and still not so rigidly as not to permit them to turn in their matrix when the cutting edges

are dulled, and thus present new and sharp edges to the carbide.

Grinding with a diamond wheel, preferably of 220 grit, 100 concentration,  $\frac{1}{8}$ -in. depth, must always be done wet. This means not necessarily a flood of coolant but as much kerosene or its equivalent in a solvent as can be gotten to the diamond wheel, wick fashion. Grinding in this manner should always be done with the periphery and not the face of the diamond wheel. The latter method presents a surface to the carbide, while the former presents a line contact.

The cutting edges of the blade should be broken by honing or, in a skilled hand, by holding against the diamond wheel. Thus a small 0.015-in. radius is

ground into the cutting edge which should never be sent to the production line sharp.

Moreover, the carbide blade should be honed on the OD and the surface over which the chip slides. Some instructions call for a finish grinding with a diamond wheel of fine grit, say 500. Others prefer hand honing, which if used will depend on the economics of the situation, that is, if the job permits additional cost for grinding which will return in terms of greater carbide life. And this latter must again be weighed against the cost of the machine down time, inextricably wound up with cutter life.

*Part 10 of this series on carbide milling will appear in the next issue.—Ed.*

## Controlling Gas Porosity In Castings

**I**N an effort to speed the practical utilization of the new scientific data on control of porosity in castings contained in the paper\* by A. J. Phillips, "Separation of Gases from Molten Metal," presented at the recent AIME meeting in New York, the Federated Metals Div. of American Smelting & Refining Co., New York, is preparing a series of recommended procedures which it is believed will aid foundrymen in overcoming rejects due to gas porosity in castings.

Dr. Phillips, manager, research department, American Smelting & Refining Co. and its Federated Metals Div., presented in his paper, for the first time,

\* See THE IRON AGE, p. 66, Mar. 27, 1947.

scientific data on the separation of gases from metals, correlated so that foundrymen may make practical application of the data in the production of castings with a minimum of gas porosity.

The paper brought out the fact that extremely minute quantities of a gaseous element can cause a great amount of porosity. For instance, if 0.0001 pct of hydrogen by weight separates from molten copper at 981°F, the volume of gas formed will be equivalent to 44 pct of the volume of the copper.

An important highlight of the paper was the recognition of the importance of oxygen in the solution of gas problems. As a matter of fact the problem of gas porosity in castings can be kept under control fairly well if the oxygen content is kept under control. Although many of the procedures used for controlling the oxygen content are fairly well known, the mechanisms have not been fully understood. Federated now expects, on the basis of Dr. Phillips' paper to present for practical foundry use scientifically correct procedures for controlling gas porosity.

Briefly, the solution of the gas problem in copper base alloys depends upon a positive control of the oxygen content of the metal. As long as the oxygen is below the equilibrium value of the hydrogen-oxygen reaction which liberates steam, no gas will separate and the hydrogen will remain in solid solution. The metal should be melted under an oxidizing atmosphere and it is preferable that the metal should contain no phosphorus. If the charge contains phosphorus due

to the use of rerun metal, it is necessary to add an oxidizing agent, such as copper oxide, or an oxidizing flux.

The metal should be superheated slightly and then removed from the furnace. After careful skimming, enough phosphor-copper should be added so that a small residual amount of phosphorus remains in the metal. This will keep the oxygen content under positive control since the phosphorus acts as a buffer to further oxygen pick-up and particularly to the oxygen concentrating in the liquid during freezing. The metal should be cast when it reaches the correct pouring temperature.

In the case of aluminum base alloys, gas porosity is caused by the liberation of hydrogen because of its negligible solid solubility and its appreciable liquid solubility at the melting point. It is well known that the solubility of hydrogen in aluminum increases with the temperature of the metal if hydrogen or its compounds are present in the combustion atmosphere. It is important therefore that superheating should be kept to a minimum when molten aluminum is exposed to hydrogen or its compounds.

The best procedure is to melt aluminum in a dry, slightly oxidizing atmosphere and at minimum temperatures. Removal of any absorbed hydrogen can be accomplished without great difficulty by shutting off the heat and flushing the metal with an inert gas such as dry nitrogen or chlorine. In crucible melting this can usually be accomplished in about 5 min.



**T**YPICAL hydrogen gas cavities in copper.





FIG. 1—Taking primary cut on 1500 lb. 18-in. thick die block at 50 fpm. Improved bands deliver perpendicular accuracy within 0.004 in. when utilizing full capacity height of machine.

AS recently as 5 years ago all materials were being band sawed at conventional velocities, regardless of the thickness involved. As a matter of fact material thickness was limited and sawing a 10-in. section with more or less perpendicular accuracy was considered a feat. It can be said therefore that, exclusive of the introduction of narrow precision saw bands a few years previously to permit contouring to a major extent, this method of cutting had, in half a century, experienced little change from the viewpoint of cutting all materials faster.

Band sawing practice has in a very short period caught up with all other cutting or fabricating processes. Today, a 20-in. thickness of steel or ferrous casting can be cut faster and with higher accuracy than a 10-in. section 5 years ago. All non-ferrous and most nonmetals can be sawed at velocities up to 5000 fpm, and cutting rates thereby increased as much as 700 pct over those of conventional speeds. At the same time the finish of the cut is tremendously improved and tool life substantially increased. Last but not least, at velocities of from 3000 to 15,000 fpm steel and other ferrous metal sections under 1-in. in thickness are friction sawed so rapidly as to render any other cutting procedure obsolete.

The prime factor responsible for this rapid upward trend was the development of better bands. Once this had been achieved it only remained to increase the size of band saw equipment and to design work-holding, feeding and other fixtures, or means to expedite individual requirements. To develop cutting tools that would respond efficiently when taking a 20-in. cut through a die block at 50 fpm, as shown in fig. 1, then use the same blading but of a finer pitch to slice through  $\frac{3}{4}$ -in. armor at 12,000

# Modern Band Sawing Practice

By H. J. CHAMBERLAND  
The DoALL Co., Des Plaines, Ill.

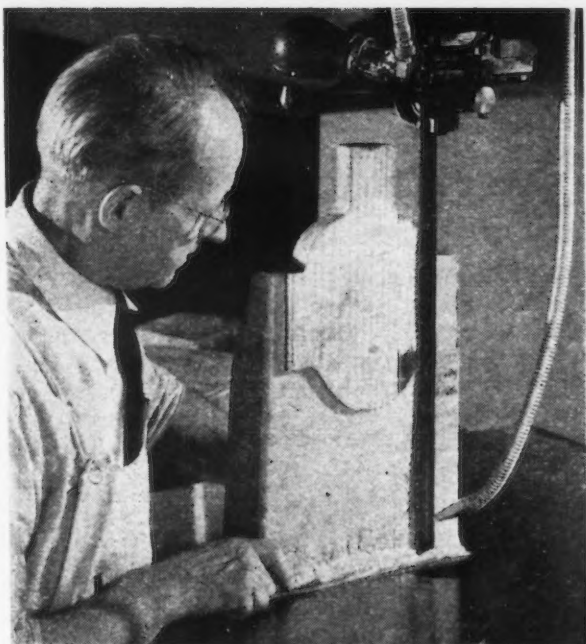
**Recent developments in band sawing emphasize a radically new trend towards the employment of cutting speeds as high as 5000 fpm in the sawing of both ferrous and non-ferrous materials, as well as plastics and other nonmetals. The technique is discussed herein, together with detailed information on an even newer development, friction sawing, in which velocities as great as 15,000 fpm are used on steel.**

fpm and cut 13 lineal in. per min, was not easy and meant tedious research. However, this was readily accomplished as soon as it was definitely determined that the correct depth of tooth hardness through the use of differential heat treatment was the secret for maximum saw life under most severe cutting conditions.

Band sawing practice as a whole, in its present revolutionary stage, is not limited to a single type of blading. The conventional sawing and friction sawing of ferrous metals are accomplished with standard pitch bands, with a limitation in pitch selection for friction sawing. It was a known fact for years that nonferrous and nonmetals respond more efficiently to coarse pitch construction, but a narrow band and widely spaced teeth of standard pitch design was an impossibility. Research led to the development of the special coarse pitch saw, known as Buttress, SkipTooth and other trade names. This saw, fig. 2, is primarily responsible for the high cutting rates now possible on wood, plastics, laminates, aluminum, magnesium, rubber and its synthetics, and many other materials.

Mention of high speed sawing of course refers to actual sawing, an increase in material thickness therefore requires a decrease in saw speed as under conventional rules. However, a single, well established, high velocity rate automatically substitutes



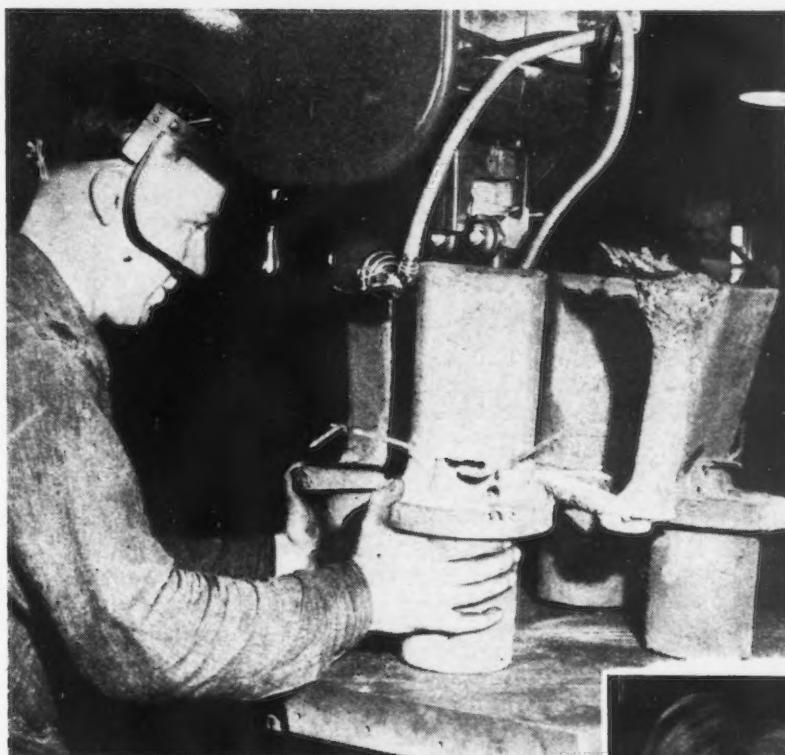


saws may be accepted as intermediates, and obviously if a contour is involved, its dimensions governs the width of band. The widest band should be used for straight cutting, but the narrow saws have no more tendency to lead than the wider ones, even through the thicker cuts.

The high velocity range is from 1500 to 5000 fpm. Most nonferrous metals, as shown in fig. 3, are cut at velocities of from 1500 to 4000 fpm. The average velocities for wood and related products are from 3000 to 4000 fpm. Some of these latter materials in the so-called tempered state, such as Temprite and other pressed wood products, possess peculiar characteristics, and in consideration of saw life a velocity of 1500 fpm seems to be appropriate, regardless of material thickness. Most plastics respond very well to velocities ranging from 3000 to 4000 fpm, and the 5000 fpm maximum is often used on the thinner cuts. Plastics having abrasive characteristics are in reality cut by a combination of actual and friction sawing. In this case the high speed saw softens the material in the kerf to some extent and carries off the semiplastic chips with greater ease than if it were operating at conven-

ABOVE

FIG. 2 — In trimming a magnesium casting with a special coarse three-pitch saw at 2500 fpm, production is three times that obtained with standard ten-pitch blades operating at the conventional 300 to 400 fpm.



LEFT

FIG. 3 — Cutting gates and risers from an aluminum casting at 4000 fpm. Note the casting nails which would immediately destroy any band operating at low speed.

for several low velocity selections required otherwise.

Now being cut at high velocities and at unprecedented production rates are aluminum and magnesium, as well as brass and copper alloys in all forms, zinc, lead, babbitt and silver, all kinds of woods, builders' board, plastics, synthetic rubber compositions, asbestos, carbon and many other non-metals too numerous to mention.

Straight or contour sawing at high speed with the new type of saw requires considerably less feeding pressure, due to the cool and free cutting action of the tool. High speed sawing also requires a smaller selection of pitch since the new coarse pitch is limited to six, four, three and two teeth per inch, depending on the width of band. The choice of pitch is four or six for a 1/2-in. thickness and two or three for a thickness exceeding 6 in; three and four-pitch

RIGHT

FIG. 4 — Friction sawing 10-in. by 3/32-in. wall stainless steel part with a ten-pitch precision saw at 8000 fpm. Production is 300 cuts per hr.



TABLE I Production Results Achieved by High Speed Sawing			
Material	Thickness	Velocity, fpm	Cutting Rate per min
Brass tubing.....	6 in. OD	3,500	20 sq in.
Brass casting.....	3/4 in. wall		
Copper alloy.....	3/4 in.	2,000	0.015 min per cut
Copper coils.....	1 in.	3,000	80 lineal in.
Zinc.....	1 1/2 in.	4,000	50 cuts
Aluminum (75 ST).....	1 in.	3,500	28 lineal in.
Aluminum casting.....	1/2 in.	2,500	20 sq in.
Aluminum channel.....	5 in.	3,000	24 sq in.
Aluminum (24 ST).....	1/4 in.	4,000	4 cuts
Aluminum billet.....	2 1/2 in.	3,000	8 sq in.
Magnesium casting.....	6 in.	3,000	40 sq in.
Magnesium (FS-1).....	3 1/2 in.	3,000	67 sq in.
	4 1/2 in.	4,000	23 sq in.
	8 in.	3,500	58 sq in.
PLASTICS			
Bakelite.....	1/2 in.	6,000	35 sq in.
Bakelite, glass impregnated.....	1/2 in.	7,000	0.35 min per cut
Sheet, thermosetting.....	1/16 in.	4,000	140 lineal in.
Cellulose nitrate.....	1/2 in. rd	3,000	215 sq in.
Celluloid slabs.....	1/2 in.	2,500	33 sq in.
Phenolic sheets.....	3/4 in.	8,000	500 sq in.
WOOD			
Rosewood.....	4 3/4 in.	3,000	95 sq in.
Plaster board.....	1/2 in.	2,500	58 lineal in.
Mahogany.....	1 in.	4,000	388 lineal in.
Red Oak.....	2 in.	2,800	250 lineal in.
Yellow Pine.....	2 in.	3,000	300 sq in.
Maple-Laminated.....	2 in.	9,000	100 lineal in.
White Pine.....	2 1/2 in.	3,000	100 sq in.

tional velocities. Table I lists typical high speed production results attained with DoALL high speed band saws.

### Friction Sawing

Band friction saws, as now being used, is actually a new process, despite the fact that it is frequently referred to as an old one. This misconception comes about as a result of attempts made a number of years ago, but which were, in effect, actual sawing rather than friction sawing. With much tougher bands, a wide range of infinitely variable speeds and rigidly constructed machines, the metal directly in front of the saw teeth now really softens.

Some of the claims put forward on friction sawing, however, have been, and still are, grossly exaggerated, and these should, for the most part, be disregarded by plants desiring to take advantage of the process. The only reliable source of informa-

tion is the test laboratory operated by the equipment manufacturer where technical reports on actual production jobs are available. The process is relatively new from a saw band viewpoint and research is barely starting. Industrial plants benefiting from these laboratory recommendations should positively not attempt to exceed the thickness limitations set by the technicians.

Two years ago the friction sawing of 1/2-in. thick steel with a band was considered a feat. This thickness was soon stepped up to 3/4 in. with but a slightly reduced cutting rate, and today 1 in. and 1 1/4 in. sections are readily separated with a band revolving at 3 miles per min. Important factors to consider when friction sawing are: Rockwell hardness has no significance, but the melting point of the metal definitely does, and strangely enough, a brand new saw is just about worthless because it reaches its peak of efficiency only after about 20 min. of cutting. In other words, sharp teeth do not create frictional heat, but worn or rounded cutting edges do.

Standard pitch precision saw bands 1/4 to 1 in. wide, as shown in fig. 4, are generally used for friction sawing, pitch selection is limited to 10, 14 and 18 teeth per inch with 10 pitch predominating. The velocity range is from 3000 to 15,000 fpm. However, 10,000 fpm should be accepted as a maximum for general practice. As material thickness increases, more heat must be generated, so contrary to standard rule, the speed of band must be increased accordingly. It is also true that the various alloys added to the iron alter the softening characteristics of the steel, so the change of heat at the point of saw-work contact must also be met by velocity adjustment.

Steady feeding pressure is quite imperative to create uninterrupted friction necessary to generate ample heat. On thin sections, such as sheet steel, the saw will cut as fast as the work can be fed. As the thickness increases, the saw offers more resistance, but will start to cut the instant sufficient heat is produced to soften the material directly in front of the saw teeth to a plastic state. Heat penetration on the side walls of the cut never exceeds 0.002 in. and for this reason many parts subject to machining strains are now efficiently friction sawed.

Because it is most essential to present a minimum material section to the saw teeth for generating a maximum amount of heat, and thereby speed cutting action, the thicker sections are preferably cut by a so-called rocking technique. The idea consists simply of slightly lifting the work from the back so the top front edge contacts the saw; pressure is then gradually exerted while the piece is lowered, and alternately raised and lowered until completion of the cut. Incidentally, some practice is required to obtain complete results and this should not be attempted by an inexperienced operator. Facts speak for themselves and listed in table II are friction sawing production results achieved on DoALL friction saws and typical of many obtained throughout industry from previous laboratory recommendations.

TABLE II Production Results Achieved by Friction Sawing			
Material	Thickness	Velocity, fpm	Cutting Rate per min.
High carbon steel.....	1/2 in.	8,000	27 lineal in.
Molybdenum steel.....	3/8 in.	10,000	25 lineal in.
High chrome steel.....	1/2 in.	10,000	80 lineal in.
High speed steel.....	1/2 in.	12,000	25 lineal in.
Saw stock.....	1/2 in.	5,000	20 lineal in.
Nonmagnetic steel.....	1/2 in.	5,000	40 lineal in.
Nickel steel.....	1/2 in.	5,000	50 lineal in.
Tool steel.....	1/2 in.	7,000	40 lineal in.
Low carbon steel.....	1 1/2 in.	13,000	5 lineal in.
Lead coated steel sheets.....	20 gage	6,000	633 lineal in.
Armor plate.....	1/2 in.	12,000	20 lineal in.
Armor plate.....	3/8 in.	15,000	14 lineal in.
Stainless steel No. 302.....	1/2 in.	6,000	125 lineal in.
18-8 Stainless steel.....	1/2 in.	8,000	400 lineal in.



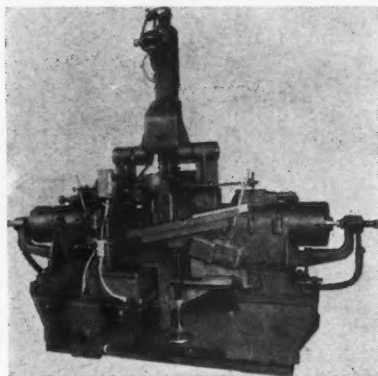
# New Equipment...

**Hydraulic slotters, wet grinders, spot welders, diecasting machines, press brakes and multipresses are described in this week's review, together with drill heads, indexing tables, hardness and surface roughness testers, gages and meters, and several material handling units.**

## Hydraulic Slotters

**1** Two large size Hy-Draulic slotters have been announced by the *Rockford Machine Tool Co.* The machines are a new 48-in. stroke slotter and the improved 36-in. stroke slotter. Massive column design provides rigidity for the heaviest duty work. The ram may be set for travel in a vertical plane or in any tilted plane up to 15° off vertical. Ram cutting and return stroke speeds are infinitely adjustable over a wide range to take full advantage of all work conditions. Because the ram is hydraulically driven, stroke lengths are easily set by valve control exactly

on all four surfaces. Wrenches are guided straight through the grinder and grinding wheel wear is even-

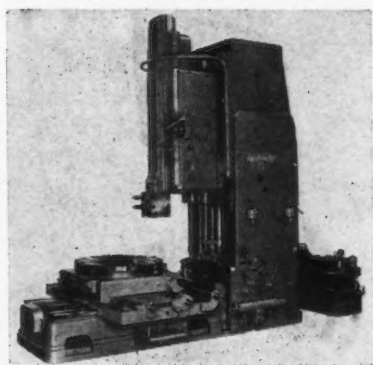


ly distributed, it is claimed. Thus the wrenches emerge from the grinder flat, parallel, and very close to a given thickness, facilitating subsequent polishing operations.

positive clamp type heat regulator and an indexed terminal block. Electrodes and transformers of all models in the series are water cooled from separate circuits with individual flow control and visual water drain.

## Diecasting Machine

**4** For shops engaged in intermittent production diecasting work, the *Robert A. Cox Co.* has designed a selfcontained hot-shot diecasting machine. It is stated the average shop employee can operate this goose-neck type machine which measures 22 x 72 x 40 in. high. The unit features single hook-ups for air, gas and 110 v electrical current and is furnished with required blow torches for heating



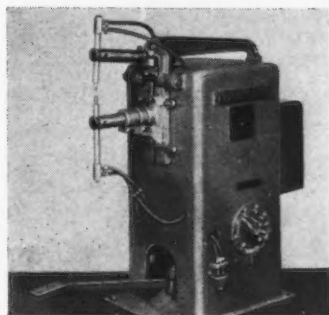
as required. Electrical and hydraulic controls are centralized on a pushbutton panel. The 42-in. diameter table provides rotary, transverse and longitudinal work feed. Cutting speeds range from 0 to 80 fpm.

## Wet Grinder

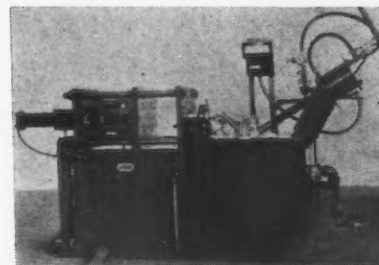
**2** Designed for grinding double and drop forged engineers' wrenches and many other parts that require grinding of parallel surfaces, a double spindle wet grinder has been introduced by *Charles H. Besly & Co.* The grinder features a combination magnetic vibrator and automatic chain feed especially arranged for speedy and accurate feeding of the wrenches through the grinder. Using oil as a coolant, the machine is said to be capable of turning out 2400 wrenches per hr, measuring 8 in. overall and ground

## Rocker Arm Spot Welders

**3** A series of rocker arm spot welders designed to handle work in the light to medium range has been offered by the *Thomson Electric Welder Co.* Available either as foot, air or motor operated machines with 12, 24 or 30-in. throat depth and 20, 30 or 40 kva transformer capacity, this series includes all purpose machines for shops doing general spot welding and special duty welders for mass produc-



tion assembly line work. These welders also feature the patented Thomson tubular secondary transformer with noncorroding, nonclogging secondary sections and hard-rolled primary windings; fabricated steel frame; heavy duty, 8-point



goose-neck and nozzle. The holding pot has a capacity of 300 lb of zinc alloy and is cast of Meehanite iron. Furnace is insulated with a 4½-in. firebrick lining.

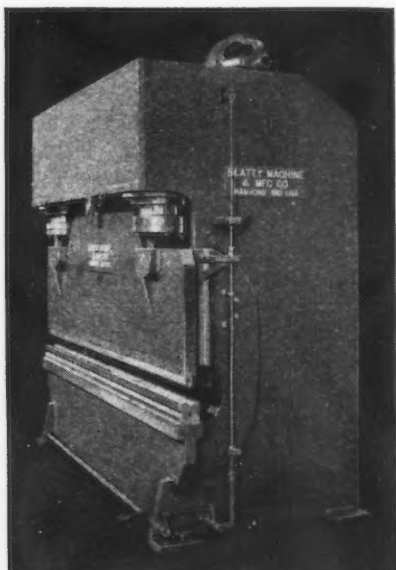
## Cutting and Grinding Oil

**5** Silver-Chip No. 60 cutting and grinding oil, a nonpetroleum, synthetic product developed by *Machinery Lubricants, Inc.*, is claimed to mix easily with water of any degree of hardness and offers a true solution instead of an emulsion. Water mixtures of 1 to 25, 1 to 50, and 1 to 100 provide high lubricity, as well as genuine transparency. The new development is said to exceed conventional water coolants in range of utility and to provide a water coolant satisfactory for numerous types of tough metal-cutting jobs ordinarily requiring more expensive straight-oil type coolants.



### Hydraulic Press Brake

**6** Adaptable to a wide variety of V bending, flanging, pressing and straightening, a hydraulic press brake has been announced by *Beatty Machine & Mfg. Co.* The brake can handle a wide variety of plate thicknesses without the need for minute ram adjustments, it is said. Factors increasing the productive speed are: The ram advances at a maximum of 310 ipm, returning at 285 ipm, while pressing under full load takes place at 14 ipm. These speeds are variable between 0 and maximum. The machine is of the open throat, closed housing type and is built in capacities from 200 to 600 tons, and in sizes from 8 ft 6 in. to 12 ft 6 in.

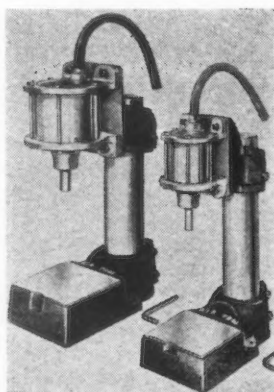


between housings. Stroke control features allow for operating in any portion of the stroke between the top and bottom limits, it is said.

### Air Arbor Presses

**7** Two air arbor presses which combine the features of both arbor and kick type equipment have been developed by *Air-Trol*. A heavy duty model delivers over  $\frac{3}{4}$ -ton squeeze at 150-lb line pressure and weighs 72 lb while a smaller model delivers approximately  $\frac{1}{4}$  ton at 150-lb line pressure and weighs 40 lb. When applied to arbor or kick type press operations, these units may be set to give the required uniform pressure on each application by regulating air line pressure. Where operated with foot

valve control, a full stroke is delivered with less than 1 in. of foot movement, it is said. Cylinder



brackets may be adjusted to give a working range or ram clearance up to 6 in. over the table.

### Variable Speed Reducer

**8** The Constantorque variable speed reducer announced by *Charles M. Zust Co.* is an improved power transmission in which the input and output shafts are permanently gear connected but so constructed and arranged that the speed of the output shaft may be reversed in direction of rotation without resort to shifting of the gears or frictionally transmitting the power from the input shaft to the output shaft. Output torque is at all times equal to the input torque at all speed ratios whether in the forward or reverse direction. This reducer operates on the principle of dissipating such revolutions as are not required on the output shaft. The smallest unit made is 2 in. diam x 4 in. long and is intended for a fractional hp motor up to and including  $\frac{1}{4}$  hp. On all sizes larger than  $\frac{1}{4}$  hp the outside dimensions of the housing are never larger than the motor size for which it is made.

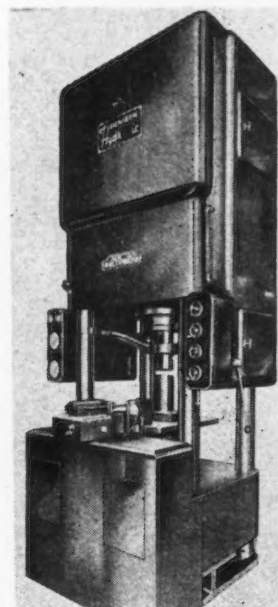
### Grinding Wheels

**9** Development of the Series 20 grinding wheels by the *Carborundum Co.* has been announced. Basically this grinding wheel is a new type of ceramic or vitrified bonded grinding wheel — a new blend of abrasive grains, so bonded as to give the optimum results in grinding, it is reported. Factors that interfere with cutting action have been reduced and those contributing to higher cutting effi-

ency have been increased. The Series 20 grinding wheels are said to be especially suitable for tool room operations such as surface grinding (horizontal spindle), tool and cutter grinding, and surface and cylindrical form grinding.

### 75-Ton Multipress

**10** Varied ram action controls are available in a 75-ton multipress made by *Denison Engineering Co.* Featuring Vibratory Control and offering a choice of three valve combinations, this new 4 strain rod press is said to meet practically every pressing-cycle need within a 75-ton range. Among its operating characteristics are automatic or manual ram cycling, fast traverse-slow pressing speed, pressure and

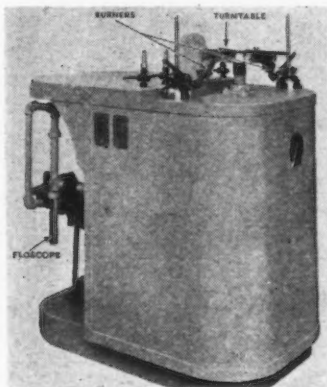


distance reversal, and low ram tonnage if desired with high return and accessory pressures. The press has a large tooling area, a 30-in. daylight opening and 18-in. stroke. It has one-man operation with all adjustments and operating controls and gages at the operator's fingertips. Simple adjustments give this press a pressure variance of from  $7\frac{1}{2}$  to 75 tons.

### Gas Heat Treating Table

**11** Annealing, hardening, silver-brazing, soft soldering and other heat treating operations can be handled at production speeds, it is reported, on a heat-treat table designed and manufactured by the *Selas Corp. of America*. A revolu-

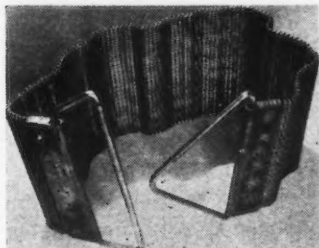
ing variable-speed jig-table accommodates work pieces of many sizes and shapes. Two superheat burners, having a turn down ratio of 40 to 1, are adjustable to any posi-



tion. To maintain fuel at the particular proportions and pressure required by each job, air and gas pass through Floscopes to a combustion controller. An automatic fire check guards the mixture line.

#### Pickling Sling

**12** For the handling of thin wall tubing in the pickling bath, a pickling sling, trade named Duplex, has been produced by the Cambridge Wire Cloth Co. It can be used for rod and bar stock as well as tubing. The sling of mesh construction with flat, even surfaces that do not protrude to collapse the tubing or scratch the finish, can be



placed around the tubing and hooked into a hoist in one operation. It is made in any desired length or width of Monel, Inconel, or other materials to resist corrosive action of the pickling solution. The sling illustrated will handle a load up to 5 tons.

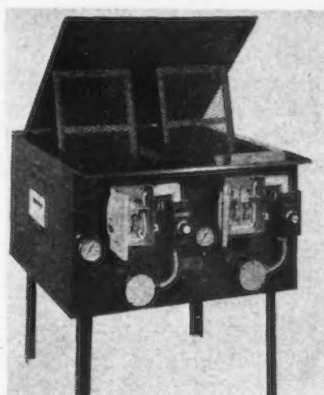
#### Stop-off Paint

**13** Development of a stop-off paint for use in nitriding has been announced by the National Copper Paint Corp. The paint, known as

Has-Cote, is an improved Sel-Nite. Has-Cote is applied either by painting, spraying or brushing on. It is a suspension of metallic solids in a quick drying synthetic vehicle that is said to set up in the maximum time of 5 min. It is not recommended for use in molten salt nitriding baths but has proved satisfactory in disassociated ammonium gas nitriding practice. Has-Cote is compounded to exclude nitrogen in an ammonium gas atmosphere and does not work in cyaniding operations. The stop-off paint is said to eliminate creep of the coating.

#### Oxidizing Compound

**14** Known as D.C. oxidizing compound, a product for producing a uniform black finish on steel parts, that will not peel, rub off, crack or chip and is rust resistant,

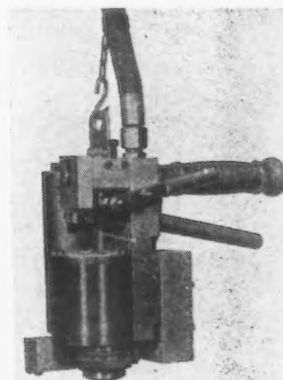


has been developed by D. C. Cooper Co. It is said a single bath produces this unique black surface in 5 to 16 min and the dimensions of the parts are not changed by the process. The compound is an alkaline salt which is mixed with water and heated. The finish is particularly suitable for metal cutting tools, machine parts, saws, bearings, screws, and small units. The special tank illustrated has been designed for cleaning and blacking small steel parts.

#### Metals Spray Gun

**15** Model FP gun has been developed for melting and intermittent spraying of low melting temperature alloys without emptying the pot during off periods, by the Metaloy Sprayer Co. The sprayer has been designed for applications such as applying a finely atomized

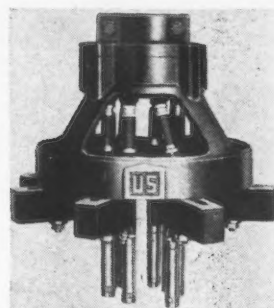
surface of sprayed metal in selenium rectifier cell manufacturing, precision casting work, coating wood patterns and core boxes in foundries, production of molds (lost



wax process), making dies, and for producing and reproducing parts for electroforming. Metal is inserted in the pot in stick form through the guide ring and feeds down as it melts. The metal can also be inserted in the gun with a ladle and funnel.

#### Drill Head

**16** Suitable for mounting on any sensitive drilling machine, a multiple adjustable spindle drill head said to be an adaptation of a flexible joint adjustable spindle, has been announced by U. S. Drill Head Co. Eight spindles, mounted in oilite bearings and heavy duty ball thrust bearings, can be adjusted to a minimum distance between spin-



dles of 11/16 in. anywhere in an area of 6-in. diam circle. The minimum bolt circles that can be drilled for equally spaced holes with 3 or 4 spindles is 1 in. diam; with 5 spindles 1 1/8 in. diam; with 6 spindles 1 3/8 in. diam; with 7 spindles 1 1/2 in. diam; with 8 spindles 1 3/4 in. diam. Maximum drill for each spindle is 1/4 in. Standard spindles are equipped with collets that will take up to 1/4-in. diam shanks.



### Bench Filer

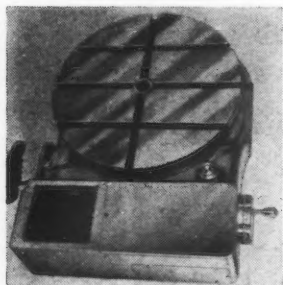
- 17** Model FH 10 precision bench filing machine for filing, sawing and honing operations is announced by the *DoAll Co.* as incorporating the patented universal joint



clamp which assures a 100 pct vertical file position despite warped or twisted file shanks. A file setting square is provided for aligning the file, hone, or saw before the universal joint is tightened. The tilting table is 10 $\frac{3}{8}$  in. sq and the machine has a 1 $\frac{1}{2}$ -in. stroke and a file shank capacity of  $\frac{1}{8}$  to  $\frac{3}{8}$  in. The unit is powered by a  $\frac{1}{4}$  hp, 110 v, 1724 rpm, ac motor which provides approximately 350 strokes per min.

### Rotary Table

- 18** Designed to quickly adapt any milling machine, shaper, or horizontal boring mill for power rotary milling or precision indexing work, a new rotary table an-

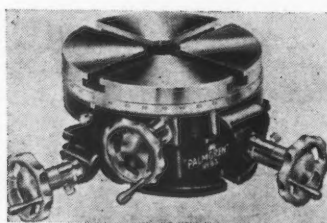


nounced by the *W. B. Knight Machinery Co.* is a single electrically driven unit which is said to virtually eliminate setup time. There is no power connection to the machine on which it is used. Eighteen feed changes from 1 $\frac{1}{2}$  to 54 ipm are provided on the 20-in. diam table. An optional feed range of 3 to 108 ipm is also available. Other

features include a simplified system of changing feed gears, graduations in minutes as well as degrees, and antifriction bearings throughout.

### Indexing Table

- 19** An indexing table with full 360° rotary movement and 4-in. cross-feed travel, made by the *Chicago Tool & Engineering Co.* and known as the Palmgren No. 83, has a diam of 8 in. with a  $\frac{5}{8}$  x 1 $\frac{1}{8}$ -in. T slot. Graduations are made in single degrees in right-angle segments. The 4-in. cross-feed movement provides 2-in. travel each way



from center and is controlled by a graduated screw which permits infinite adjustment within the travel range. The base has four bolt and key slots for rigid mounting to milling machines, drill presses, shapers, or surface grinders.

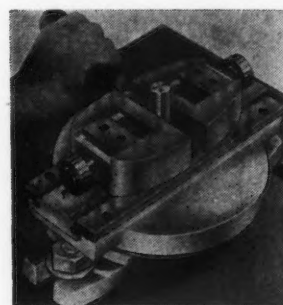
### Small Hole Gage

- 20** A self-centralizing indicator gage designated Model 1204, has been announced by *Federal Products Corp.*, for inspection of ID sizes between 0.250 and 0.500 in. The spring-centralizing design plus the precise measuring contacts and motion transfer units locate themselves in the hole and are said to indicate the true diameter with a high degree of accuracy, revealing also roundness, taper, bell-mouth, and other hole inaccuracies. Fourteen interchangeable extensions are employed to cover the full range from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. The instrument explores any hole within its capacity to a maximum depth of 2 $\frac{1}{4}$  in.

### Selfcentering Vise

- 21** A selfcentering, double cam actuated vise which centers the work to the drill or cutter regardless of the dimensional variation of the piece has been introduced by the *Williams Products Co.* One-hand operation and locking permits faster usage and greater efficiency

it is stated. The frame and carriage are machined from iron castings while the cam plate is made from alloy steel. There are no bearings to oil or grease. The machining is held to close tolerances and the jaw blanks ground for square-



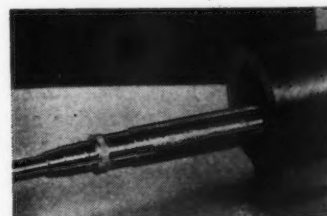
ness which allows the vise to perform accurate secondary operations at high speed with maintenance at a minimum. Through the center is a 3-in. opening which allows the work and chips to fall clear when the cam lock is released.

### Hardness Tester

- 22** Recommended for light and heavy load testing, the model LR Tukon hardness tester, known as the long range model, applies loads of from 25 to 50,000 g. Manufactured by the *Wilson Mechanical Instrument Co.*, the instrument is designed for testing with either the Knoop or 136° diamond pyramid indenter (Vickers type). Features include a fast speed elevating screw for adjustment to specimen thickness and a meter indicating completion of test cycle. Loads of 10,000 g are furnished as standard equipment.

### Surface Roughness Tester

- 23** A tracer to be used with the Profilometer for taking microinch surface roughness measure-



ments in deep bores such as hydraulic cylinders, camshafts and tubing, has been announced by *Physicists Research Co.* This tracer, known as type LA, will measure



to any desired depth in holes as small as  $\frac{3}{4}$  in. ID and can be used with any type of Profilometer. The tracer is mechanically operated by means of a Mototrace and Type BA Linkarms of various lengths which make possible measurements at various depths to 36 in. The diamond tracing point is self-adjusting to the work surface.

### Pneumatic Gages

**24** Featuring reversed-flow air control, a line of pneumatic and taper gages, known as New-Matic, has been developed by *Merz Engineering Co.* The reversed-flow principle provides both a calibrated measurement scale of the required magnification and a zero adjustment for returning the calibration to a basic value. Gages are equipped with continuously variable and adjustable orifices, making possible the control of air volume, as well as air pressure, and providing "bal-



anced air" for high-precision measurement. The instruments are made in five models to fit inspec-

tion requirements in the gage laboratory, on high-speed production operations, and for checking finished dimensions at the machines. The Master model, illustrated, offers a standard calibrated scale for any required magnification up to 20,000:1. The Versatile model provides a normal scale covering 0.004 in. and magnification of approximately 1000:1.

### Comparator Gage

**25** Three models of a four range electromagnetic type comparator gage have been announced by the *Metron Instrument Co.* Vacuum tubes and other limited-life components have been eliminated. The in-

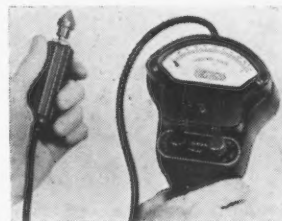


corporation of four ranges of magnification selected by means of range switches makes a single gage suitable for a wide range of gaging applications, from checking gage blocks to production inspection of machined parts. Model 10 has a range of from 0.000001 to 0.0004 in.; model 20 has a range from

0.00001 to 0.005 in.; the range of model 30 is from 0.00005 to 0.020 in. Gages are available in English or metric units. Spindle pressure is adjustable and calibrated from 4 oz to 2½ lb and the head can be rotated at any angle about the column or in the vertical plane for versatile application.

### Linear Speed Meters

**26** Now available are type 25D hand linear speed meters manufactured by *Metron Instrument Co.*,



for measuring speed of travel of products through processing mills and presses. Usually supplied as single range instruments, they are designed to provide an accuracy of 1 pct and are available in ranges from 3 to 3000 rpm or 10 to 10,000 fpm. Contact to the moving member is made with a replaceable free running disk 1 ft in circumference, which is solidly clamped on the rotating shaft of the head.

### Inside Micrometers

**27** Called the Rimat, an inside micrometer has been announced by the *Richards Machine Tool Co.* With Rimat inside micrometers, the reading is direct. The tools are said to be great time savers when machining back of a flange or boring recesses that have

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### THE IRON AGE, New York 17, N. Y.

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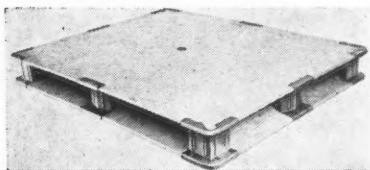
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New York, N. Y.

to be kept to close limits. In such instances, the tool can be inserted, the measurement taken, the measuring pins retracted and the tool withdrawn. The ends of the measuring pins are hardened and ground on a radius for accuracy and to prevent cramping. The micrometers have a range of 1 in. and are available in 2 sizes; 3 to 4-in. size with extra measuring rods up

to 6 in. and the 6-in. size with extra measuring rods up to 12 in.

#### Plywood Pallets

**28** As companion units for Clark fork lift trucks, durable pallets made of plywood are announced by *Clark Tructractor, Div. of Clark*



*Equipment Co.* Constructed with 5/8-in. plywood decks and posts of plywood blocks or metal, the pallet is said to weigh only a little more than half as much as a comparable hardwood pallet. It is double-faced, designed for 4-way fork entry, and

can be furnished in the metal-post construction for use with handlift or motorized pallet trucks. Sizes range from 30x40 in. with 2-in. vertical clearance and weighing 36 lb, up to 48 x 60 in. with 3 3/4 in. clearance weighing 98 lb. Capacities are 4000 lb carrying load, and 16,000 lb static load.

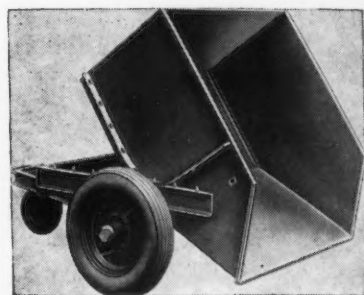
#### Welding Rod Coating

**29** Announcement has been made of metallic coating called Eutectofilm which is now being applied to the line of low temperature gas welding rods manufactured by *Eutectic Welding Alloys Corp.* Advantages claimed for rods so coated are improved welding characteristics, higher physical weld properties of weld deposit, better surface alloying at low base metal heats and protection of the filler rod from corrosive attack which would have detrimental effect on weld metal and its flow. Also announced is a new type of welding rod which requires less heat and can be used successfully, it is said, on cast iron, steel, copper, brass, aluminum, zinc diecastings and for overlaying.

#### Trailer Dump Truck

**30** Improvements in the design and construction of the Phil-Dump trailer truck have been announced by the *Phillips Mine & Mill Supply Co.* The trailer is now equipped with pneumatic tires, and a center caster which is optional, for greater maneuverability, ease in handling, faster haulage and dumping of scrap, castings, sand, etc. in steel mills, foundries and

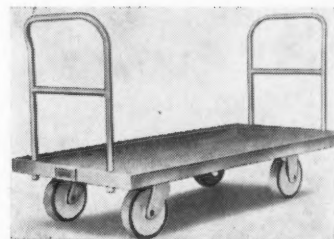
other industrial plants. Its construction includes the roll-over type body, chain release, and quick re-



turn to normal position. Of welded construction the Phil-Dump trailer has a capacity of 1 cu yd.

#### Aluminum Trailer

**31** An aluminum trailer or hand truck has been added to the tractor-trailer line of the *Mercury Mfg. Co.* Weighing 175 lb, the unit has a nominal capacity rating of 2000 lb and is built with a load



platform 3 ft wide x 6 ft long x 14 1/2 in. high. Trailer frame is constructed from aluminum alloy structural shapes and deck is non-skid aluminum plate 3/16 in. thick. Deck and frame are a welded assembly. Wheels are equipped with solid rubber tires.

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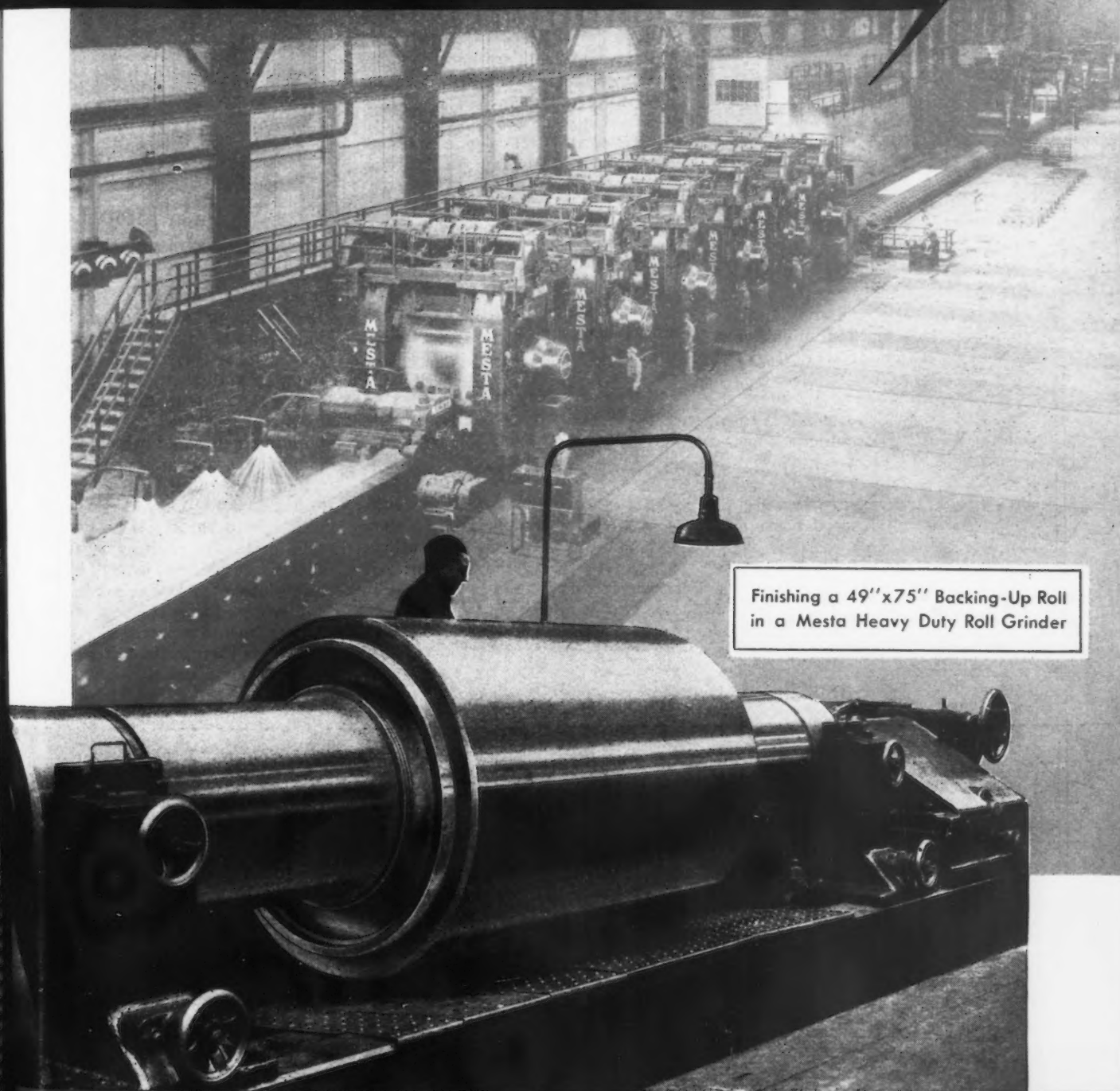
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# Assembly Line . . .

WALTER G. PATTON

Henry Ford's death saddens Detroit . . . More than 100,000 citizens pass bier of the industry's best-known genius.



**D**ETROIT—When Henry Ford was taken to his final resting place on Apr. 10, the wheels of the motor industry throughout the entire nation paused to pay fitting tribute to the man who, more than any other individual, has shaped the industrial destiny of this nation.

By hitching the basic need of low-cost transportation to a new manufacturing technique—mass production utilizing moving assembly lines—Ford put the world on wheels and gave Detroit the most gigantic industrial boost any U. S. city has ever received from one of its citizens. All Detroiters concede this. No one here can visualize an automobile industry without Ford. No one can visualize what Detroit might have been without him.

Detroit remembered all this when Henry Ford died. On Wednesday more than 100,000 persons filed slowly past his bier at Greenfield Village for the purpose of having one last look at the man who made this city great. Reporters watching crowds could find only an occasional Ford crony in the waiting lines that stretched more than a mile and created one of the city's nastiest traffic snarls.

Most of the people waiting in line had never known Henry Ford in life. Only a few had ever seen him. But they came just the same, including workmen in overalls and

fashionably dressed business executives.

The following day 20,000 more stood in the rain to see his funeral procession.

Understandably enough each desired to pay tribute to the creative genius whose name is now inseparably synonymous with Detroit and who created a new industrial age—if he did not create a new civilization.

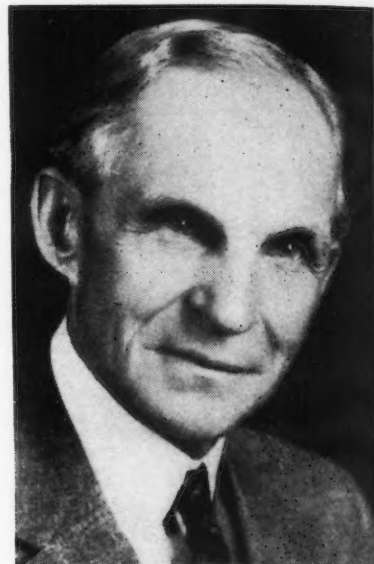
Even if existing tax regulations did not for all practical purposes preclude the possibility of another Ford empire it seems fantastic to believe that the Ford success story will ever be repeated anywhere under any circumstances.

The actual extent of the Ford fortunes cannot now be determined. However, up to May 31, 1935, it has been reported that the company's total business was \$11,725,684,518. Total payroll aggregated \$3,358,740,012. Total purchases were estimated at \$7,316,104,289 and total taxes paid at \$552,982,209.

To this staggering total Ford has since added another 8 years production of passenger cars and trucks. In addition, Ford production for the armed forces during the war of aircraft and aircraft parts, tanks, jeeps and trucks aggregated many additional millions.

**H**ENRY FORD'S favorite philosopher, Ralph Waldo Emerson, has said that great institutions are but the elongated shadow of a man. If this is true in any case it was true in the case of Ford where Ford himself made all the important decisions in the earlier years. He also made many of the important decisions from 1919 to 1943 when his son Edsel was president of the company. On Edsel's death, the elder Ford stepped back into the picture again for a few brief months, turning the presidency of the company over to Henry II on Sept 21, 1945. Since that time, it is believed that Henry II has had a relatively free hand in directing the destinies of the vast Ford empire that now girdles the globe.

A number of commentators have observed that Henry Ford was perhaps the most unpredictable and enigmatic industrialist this country has ever seen. His famous state-



HENRY FORD

ment, "You can have any color you like as long as its black" could hardly have come from any other man. Yet even while he was making this statement, the public was aware that few manufacturers had greater genuine concern about building a product which the customer liked and at a price the customer could afford to pay.

Similarly, Henry Ford's basic idea that a car could be built and sold in the price range that was within reach of every working man's pocketbook was rank heresy and resulted in a split with Ford's earlier business partners. A fresh start was then made along the line Ford insisted upon.

Again, Ford stood alone in his opposition to the Seldon patent and his subsequent victory in the courts at the Supreme Court level was a turn only he dared to predict and back to the limit of his resources.

**F**ORD took on an entire world of opposition when in 1914 he embarked on the ill-fated Oscar II to make a futile attempt to "get the boys out of the trenches by Christmas." Although he failed dismally in this venture there are many now who are willing to concede that this may have been Ford's "finest hour."

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# EASTERN STAINLESS



Looking back, it now seems that Ford was meeting opposition at every turn, either from his own stockholders, his competition, or his own talents for creating personal controversy by vast pronouncements on almost any public question that happened to be important to him at the moment.

Henry Ford has to be taken for what he was and what he did; he cannot be explained. Few rules were ever made it now seems that he could not break successfully. He took spectacular gambles and won where others would not venture. Through no conscious effort of his own he got endless publicity and world attention.

Except that Detroit had Henry Ford, there was no reason why Cleveland, Toledo, or Cincinnati should not have become the motor capital of the world. Ford was the decisive factor in determining Detroit's destiny and he did his work in such a spectacularly successful fashion that the world saw fit to reward him with the greatest material empire ever built by commerce alone.

**L**OOKING back, the Ford story could scarcely be more amazing. For 20 years the company

struggled to turn out its first 5 million cars. The next 5 million were built in 3 years. On May 25, 1927, the 15 millionth Model T rolled off the assembly line. Then came Model A. The 20 millionth car was built on Apr. 14, 1941. Today the total stands at 30 million.

The vast Rouge plant where practically all manufacturing has been done since 1927 is turning out 4200 cars per day including assemblies made in 52 branches in the United States and 31 abroad. All-time Ford production peak was October, 1935, when daily output reached 9,109 cars and trucks.

Detroit can be grateful for another aspect of Ford's character. A firm believer in the philosophy that no man is well-established in his place until he has selected and trained a successor, Ford started early by making his son Edsel president of the Ford Motor Co. in 1919. Because of Edsel's untimely death in May, 1943, Ford at 80 had to step back into harness. He remained as directing head of the company until Sept. 28, 1945, when Henry Ford II succeeded his grandfather as head of the Ford empire. The elder Ford had continued since that time as a member

of the board of directors and in an "advisory capacity."

In the meantime, vast changes have come over the Ford operations. For many months Henry II has been building a "team" that many believe in due course will challenge and even overtake its competitors in the race for leadership in the automobile industry.

If the younger Ford fails to reach his goal it will not be because any effort has been spared to attract the best available men to the team. Nor will it be because there is any lack of confidence that the new organization is unequal to the job it has laid out for itself. One cannot visit the Rouge plant these days without carrying away the impression that the younger Ford is as determined to succeed as his grandfather. And no obstacle ever succeeded in holding for long the genius that was the older Henry Ford.

**P**ROBABLY the most appropriate words spoken about Henry Ford were delivered by the Very Rev. Kirk B. O'Ferrall, dean of St. Paul's Cathedral, Detroit, at the funeral services. Said Dean O'Ferrall:

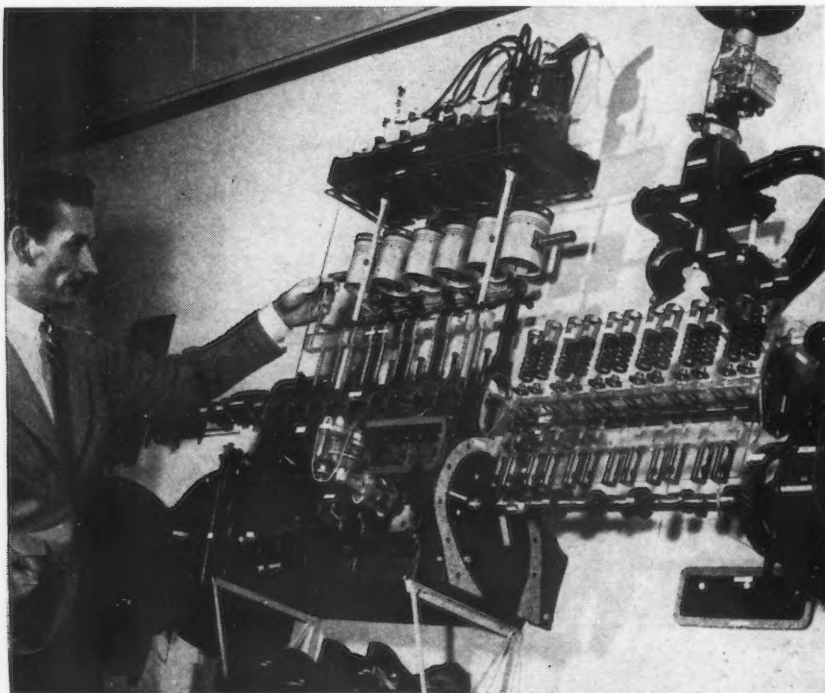
"Few great men are appreciated by the generation in which they live. Their ideas are generally far in advance of their contemporaries and arouse incredulity in many minds. The creative geniuses of the race are often maligned and persecuted.

"I imagine in the early days of Henry Ford's great career this may have been true, but as today in humble simple fashion he is laid to rest with his fathers, the world is able to see and recognize as a great boon to humanity the idea he set himself to realize many years ago."

In his address, Dean O'Ferrall emphasized Ford's dislike of ostentation and pomp; the continuance to the end of his simple personal tastes and habits. "I doubt," the Dean said, "whether any man of great wealth ever gave more away without knowledge of the world and his fellows generally."

Finally, Henry Ford's life-long devotion to his home, the fine example of homelife he set and his devotion to his early surroundings in the city and community he served so well were emphasized. Neither Detroit nor the world will have an opportunity to forget Henry Ford.

**HERE'S HOW IT WORKS:** All parts of the drive unit of an automobile chassis have been laid out and mounted in correct relative positions on a 224 sq ft board at Studebaker Corp. The aim of the project is to show how an automobile works and how its components fit together. Shown here is a section of an auto engine. The parts have been drawn in three directions from the block and mounted in transparent plastic brackets. Studebaker uses such displays in the training of its plant and field parts staffs.





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**AJAX**  
HUGEN

ELECTRIC SALT BATH FURNACES

• Portal pay decision due . . . Greek aid divided between military and economic . . . Level of German industry queried . . . Nonresidential building reduced \$2.2 billion.



WASHINGTON—Final Congressional action on portal pay legislation is expected soon, possibly late this week. A presidential veto is still a 50-50 possibility, depending on which side of the political fence the oration is being made. Democratic bigwigs say a veto message has been prepared taking up each and every point contained in the House and Senate approved versions. Republicans say the House-Senate conferees will come up with a bill the President will be obliged to sign.

Should the legislation be vetoed, the President will express willingness to sign a simple bill outlawing existing suits and fixing a time limit on future cases involving other than fringe issues. Such a recommendation would probably be acted upon speedily, since both parties realize that failure to act on the problem will likely mean prolonged troubles in the steel and other wage negotiations. While the House could override a veto, it is doubtful if sufficient votes could be mustered in the Senate.

The most troublesome issues holding up the bill are those pertaining to the limitation on legitimate suits under the wages

and hours law and the actual methods to be employed in outlawing future portal pay suits.

The House has been holding out for a 1-year statute of limitations, while the Senate bill called for a 2-year limit. The final bill will probably call for a 2-year limitation.

On the subject of a possible veto, influential members of both parties are able to build up a good case as to why a veto is not likely. The reasons given appear logical.

Probably the most important of these is the government's large financial stake in portal pay suits. The War and Navy Depts., Maritime Commission, and the Treasury Dept. are all vitally concerned.

Attorney General Tom Clark in announcing the government's intent to drop out of the Mt. Clemens test case as a result of the agreement on the part of both principals to dismiss the case said that such action means "there can be no recovery against the Mt. Clemens Pottery Co. which can be the basis for a tax claim by that company against the government based upon the payment of such claims. The United States would, therefore, no longer have a direct financial interest in this case."

Mr. Clark would also find difficulty in justifying a veto message for the President in view of his stand on the Gwynne bill last spring. This bill set up a statute of limitations affecting actions for which a specific limitation is not provided. It was aimed primarily at suits brought for back pay under the various Federal labor laws.

Mr. Clark endorsed this bill, except for the 2-year statute of limitations provision, for which he suggested the substitution of a 5-year period. As to the principles of the legislation, Mr. Clark stated on May 24, 1946, "The enactment of the bill is purely a question of legislative policy concerning which I have no recommendations to make."

THE Administration's \$300 million loan request for aid to Greece will be divided almost evenly between expenditures for military needs and restoration of

the Greek domestic economy, according to Under Secretary of State Will Clayton.

For political and military reasons, it is felt that half the total should be earmarked for making available to the Greek army the arms, ammunition, rations and equipment necessary for restoring order. It is felt that little real progress can be made until the people are assured of peaceful domestic conditions.

The remaining \$150 million would be utilized in helping to get the Greek domestic economy back on its feet. In order to do this, a third of this amount or \$50 million would be spent for importation of raw materials and equipment, since the total gold and dollar resources available to Greece for foreign buying amount to \$14 million or less.

First priority would be given to reconstruction of the nation's transportation system. War completely wrecked the railroads, while the highways are reported as little more than a series of potholes which quickly wreck dilapidated vehicles. What is needed, according to Mr. Clayton, are considerable quantities of rails, rolling stock, structural steel and bridge building material, road machinery, and some motor vehicles.

Next in importance is the restoration of the utilities and the communications systems, requiring imports of electrical machinery and communications equipment. Hydraulic dredges, drag lines, bulldozers, tractors and other similar equipment need to be imported for restoring dams, dikes and canals governing essential flood control, irrigation, etc. This would be for the purpose of boosting agricultural and raw material production. While UNRRA has made some progress in the importation of livestock, farm machinery, food processing equipment and the like, it is felt that at least an additional \$20 million is needed for this purpose.

This \$20 million for agriculture and \$50 million for other reconstruction are to cover the cost of foreign goods and services touching the program directly; the remaining \$80 million would be ex-





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# **WISCONSIN Sulfite-TREATED STEEL**

THE IRON AGE, April 17, 1947—79

pending for domestic labor and materials such as are available.

In contrast with the proposed expenditure of the money asked for Greece, none of the \$100 million requested for Turkey is intended to be spent for civilian supply purposes. Turkey already has \$245 million in foreign exchange. All of the United States money will go for military supplies and equipment, or, as the State Dept. explains it, "for purposes which will contribute to the security of Turkey . . . including equipment for the Turkish armed forces and, possibly, related projects such as rehabilitation of Turkish railroads."

**W**HILE Congress is having considerable difficulty in making sizable dents in government spending, the legislators are doing their best to make certain that additional money requested by the various departments is not being wasted.

In studying a recent War Dept. request for an additional \$300 million for government and relief in occupied areas, individual legislators quizzed War Dept. officials rather closely as to United

States aims regarding industrial rehabilitation in the occupied countries. As a result, some interesting information on War Dept. plans for putting Germany on a self-sustaining basis in 3 years was brought out.

While the annual steel capacity and production figures of 7.5 million and 5.8 million tons, respectively, are well known, there are many other German industries for which plans have not been fully discussed.

By 1950, the War Dept. hopes to have German industry operating at the following levels: Copper, 140,000 tons; zinc, 135,000 tons; lead, 120,000 tons; tin, 8000 tons; nickel, 1750 tons; aluminum (consumption), 30,000 tons; magnesium (consumption), 1000 tons; mechanical engineering (excluding agricultural engineering and ball and taper roller bearings), 1651 million reichsmarks; precision instruments and optics, 340 million reichsmarks; agricultural tractors, 10,000; private cars, 40,000; commercial vehicles, 40,000; light road tractors, 4000; motor bicycles, 10,000; electrical engineering, 1 billion reichsmarks; chemicals, 2842 million

reichsmarks; cement, 800 million tons; electric power, 900 million kw; coal, 155 million tons; railway wagons, 30,000; passenger coaches, 1350; luggage vans, 400; agricultural machinery other than tractors, 258 million reichsmarks; textiles, 665,000 tons; rubber, 59,000 tons; paper, 21,129,000 tons; boots and shoes, 113 million pairs.

These estimates are what is believed necessary to place German industry on a self-sustaining basis, thereby relieving the United States of the responsibility for importing large quantities of food and other commodities.

With Russia pushing for a higher level of industry and blocking plans for the unification of Germany, some of the American aims may not be easy to attain.

**A** RECAPITULATION at the end of the first year of the emergency housing program reveals that approximately \$2.2 billion worth of proposed industrial, commercial and institutional construction was shut off by the CPA in order that materials might flow for residential housing.

While this is very near the figure of \$2.5 billion as estimated a year ago by John D. Small, then CPA Administrator, as the amount that would have to be denied if residential housing goals were to be met by the Housing Expediter, these figures do not tell the whole story. The effect of CPA restrictions has probably been well in excess of the \$2.5 billion, since there is no means of estimating the large amount of nonhousing that most certainly was discouraged without formal denial of permits by government officials.

Nor is there a figure available for the amount of postponements until at least July of the current year made at the urging of officials. This could be conservatively estimated at a third of a billion more, inasmuch as reasonably accurate statistics for the first 6 months—through September—show that the known figure approached \$175 million.

Difficulty in obtaining materials, however, did not seem to be the main reason for agreement to such deferrals. Rather, the excessive costs of such construction appeared to be the deciding factor, accounting for 48 pct of the delayed building against 14 pct for materials difficulties.

## THE BULL OF THE WOODS

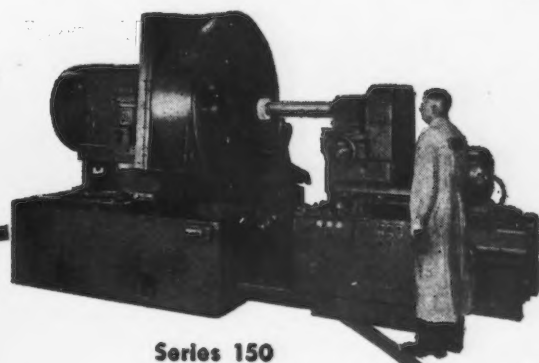
BY J. R. WILLIAMS





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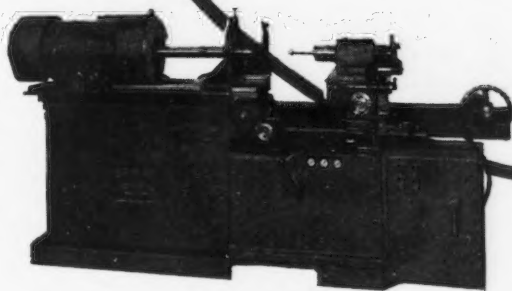
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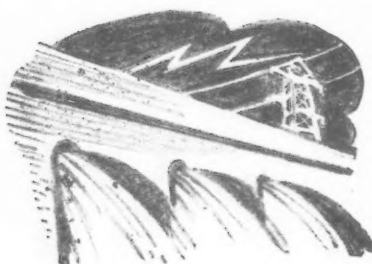
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# West Coast

**Alloy steels widely used in can-making industry . . . Northwest sheet metal fabricators grow more bitter . . . General Motors plant reports high labor turn-over.**



**L**OS ANGELES—Can-making is now one of the important industries on the West Coast. During the past 25 years, alloy steels have practically replaced 75 pct of the straight carbon steels in this industry, according to George M. Huck, manager, alloy and tool steel sales, Bethlehem Pacific Coast Steel Corp. Speed of the various machines used, such as body makers, flangers, seamers, automatic presses, dies, scroll dies, etc., have increased as much as 200 pct. This also applies to can-closing equipment in use in customers' plants.

"This naturally calls for an increase in tensile properties and a weight reduction of the various moving parts, and this is only possible by application of alloy steels. Where formerly 0.30 to 0.40 carbon steels were used for shafts, they are now using nickel-chromium, molybdenum, or chromium-vanadium steels with 0.40 carbon. Case-hardened parts, formerly 1020 or screw stock, are now made in the lower-carbon alloy grades," Mr. Huck said.

Ninety pct of all seaming chucks and seaming rolls are now stainless steel, either type 440-A or 440-C. This is due primarily to the number of products with high acid content now being packaged. An added advantage is that the

ROBERT T. REINHARDT

wear resistance together with the toughness is much greater than in the cheaper grades of carbon steels.

Body makers are now being designed for speeds of 400 to 500 cans per min. At such speeds the moving parts must be light as well as strong.

Blanking and forming dies formerly made of plain carbon steel with 0.75 to 0.90 carbon are now made exclusively of alloy steels. The higher carbon alloys are used both with normal heat treatment and case hardening. The latter was developed by one of the leading can companies back in 1932 and is now considered good standard practice. A core hardness of Rockwell C-44 and a case hardness of C-63 to C-64 are obtained by such treatment. Breakage has been practically eliminated by this practice.

Stainless steels of the various types, 302, 303, 410, 416, 420 and 440 are used in the manufacture of customers' equipment; also high-nickel cast iron and high-nickel bronzes. Some of these machines are used in packing highly acid products such as orange juice, grapefruit, pineapple, berries, etc., all of which are very corrosive. While the first cost of these materials is high, the lower upkeep and the longer intervals between overhauling make them economical in operation, Mr. Huck concluded.

**S**ALT LAKE CITY—John L. Lewis' "safety strike" disrupted coal mining in Utah for 1 day. On Apr. 7 the industry operated at about 75 pct, which was normal for a post-holiday Monday. But on Tuesday production dropped to about 30 pct. Among the closed mines were those which supply Geneva Steel Co. and the Fontana Steel Co. By Wednesday approximately 80 pct of the miners were back at work and plans to reduce coke production at Geneva and Iron-ton were canceled out before they were put into effect.

One aspect of the whole work stoppage in this area might pose some legal questions for the government and the union. Lewis' position that no contract violation was involved was based on a provision of the 1941 contract permitting memorial holidays. But op-

erators in three states—Utah, Wyoming and Washington—were not parties to that contract, inasmuch as they negotiated a separate agreement that year. Some of them are toying with the idea of raising the question of how the provision in a contract to which they were not a party can be carried forward to cover them in 1947.

**S**EATTLE—Sheet metal producers have been moved into an even smaller doghouse by sheet metal fabricators of the Pacific Northwest.

As one fabricator puts it, "The customer relations of the steel companies have been rotten. The West Coast as a whole is considered second rate, and those people using sheet metal in the Northwest might as well be Indians. We get no consideration."

To aggravate the situation, there is a prevalent belief among many fabricators that sheet steel should and could be made available if only the producers would be willing to recognize the needs of the area. These men cite instances in which their purchasing agents have been able to buy steel in almost every part of the country outside of New York and the West Coast, and have it delivered in carload lots. In several instances, it is alleged that when the steel was unloaded it was found to be from a manufacturer who had frequently refused to make deliveries in the Northwest for more than 2 years. This situation naturally gives rise to talk of "grey market" dealings, but there is considerable evidence to indicate that producers themselves are not at fault on that score.

It is the sober reflection of several fabricators that this steel is coming from surplus stocks of manufacturers who, through their inability to get other components, found themselves with a surplus of sheet metal and are taking advantage of the situation to increase their profits. It is believed that some of these fabricators who have had to cease or curtail production of sheet metal products, are finding the sale of surplus sheets a more profitable venture than manufacturing.

Aluminum sheet producers are making the most of the situation



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and more and more fabricators are swinging over to this product wherever possible. Practically all fabricators have a soft spot in their hearts for the lighter metal and their representatives who have shown more than ordinary eagerness to cooperate in solving production problems inherent in the adoption of a new material. Some of the fabricators now estimate that they are using approximately 50 pct aluminum instead of 100 pct steel and that they have no intention of going back to steel when it does become available. The problems which they faced during the changeover to the lighter material have been solved and now that they have learned to handle aluminum they seem to have a preference for it in many instances.

As is heard on a national scale, the small sheet metal fabricators are the ones finding the shortage most acute since they have not had mill connections as they do not buy in carload lots and are dependent on jobbers and warehousemen. They also seem to be more price conscious and in many cases they have had to seriously curtail production and refuse orders.

Added to its raw materials problem, the Northwest Metal Products,

Inc., now has 125 workers out on strike in an effort to eliminate the differential between wages of men and women workers. The strikers are members of the United Steel Workers of America and in addition to the reclassification of jobs, they are asking wage increases.

**T**HE Aeronautical Mechanics Union has filed strike notice against the Boeing Aircraft Co., although negotiations are continuing. Harold Gibson, the union's president, reports that his group is asking for wage increases averaging approximately 10¢ an hr and a consolidation of the present 10 labor grades into five, which would result in additional increases to about 3500 workers. Other demands include 8 holidays with pay, double time for overtime, night shift differential increases, sick leave with pay and liberalization of the vacation plan.

One of the few bright spots in the metal industry in this area is an easing up in the scrap situation. Although no downward adjustments in price are expected there is considerable evidence that the dealers who have been holding scrap for higher prices are getting jittery and the material is flowing into the

openhearth more readily than it has for many months.

Operations at the newly opened Tacoma Powdered Metals Co. at Tacoma, Wash., are being watched with considerable interest.

While there are apparently several bugs in the operation and production is low now, it is increasing daily and the plant is said to give promise of operating satisfactorily. It is reported that 10 to 12 tons of powdered iron per day is expected when the plant is running at capacity. (THE IRON AGE, Mar. 28, 1946, p. 78.)

**O**AKLAND, CALIF.—A shortage of steel products was ranked along with labor absenteeism and high turnover as the principal reasons for the local General Motors and Fisher Body plants producing cars below capacity, according to John Brown, superintendent of the GM plant.

Despite these handicaps, 40 Chevrolets an hr are being turned out with but few interruptions in the schedule. Occasionally cars are driven off the end of the assembly line minus chrome trim or another exterior part, but usually a shipment of the missing part arrives in time to make scheduled deliveries of the complete car.

Absenteeism is reported as running as high as 10 pct today which is about six times the prewar normal, and labor turnover is as high as 50 pct in some departments.

On the other side of the labor picture is the high praise given for increased production per worker which is said to be equal to prewar efficiency in most departments. The 2100 employees were recruited from all walks of life and former occupations when postwar production rose and considerable training and retraining has been necessary.

Company officials attributed the heavy labor turnover and absenteeism to a general unrest and uncertainty on the part of the workers in regard to the future and to the fact that many are returned service men who are still seeking their niche in the economic picture. It was pointed out that as this condition is stabilized, still greater productivity will result and can be passed on to auto buyers in the form of lower prices.

Further curtailment in the supply of parts is expected to affect production as a result of the floods in Flint, Mich., last week.

**BRINE TO ASH, AND BAUXITE TO ALUMINA:** *Here in the desolate area on the edge of Owens Lake, Inyo County, Calif., The Permanente Metals Corp. is producing 100 tons of soda ash per day from brine pumped from the lake to supply the company's plant at Baton Rouge where bauxite is converted to alumina. This plant was completed in 67 10-hour shifts to break the bottleneck in alumina production caused by the soda ash shortage. (THE IRON AGE, January 23, 1947, p. 84).*





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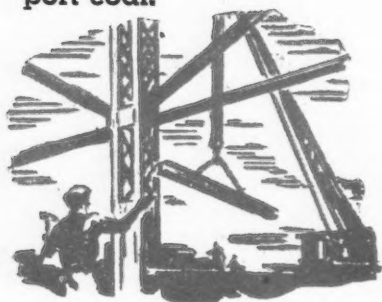
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• British trade union and federation of industries urge raising coal goal to 220 million tons for this year . . . Reports plans to temporarily import coal.



**L**ONDON—The British Government is going forward with its plans to avoid economic disaster, but the determination of a certain solution is proving somewhat more difficult than was originally imagined by some civil servants. Sir Stafford Cripps stated in the second of a new series of press conferences that it will probably be June before a fuel allocations system for the summer can be determined. At present industry is going along on the basis of the allocations announced last January, with the steel industry getting about 75 pct of its normal demands.

The government has now received detailed proposals for recovery from the Federation of British Industries and from the Trades Union Congress, both of whom have taken exception to the government's coal target of 200 million tons for this year. Both the industry and labor sides have expressed the view that the target should be 220 million. All of the talk—Sir Stafford Cripps in two press conferences acting as the assistant Prime Minister has devoted considerable time to defending the lower figure—seems to hinge around a definition of

words. Everyone agrees that the target should be to get as much coal as possible this year. The government is just in a position where it does not want to set a coal target which might serve as a source of future embarrassment if unfulfilled.

Bearing in mind the fact that the No. 1 problem at the root of the British depression is coal, both the T.U.C. and the F.B.I. have given considerable space to the expansion of coal production. The Trades Union Congress have declined to publish their proposals until they have been discussed in detail with the government, but the Federation of British Industries have received considerable newspaper space on their program.

The government plans, in Sir Stafford's words, "To get in touch with both parties as soon as possible to discuss these documents with them." Inasmuch as British industry is suffering heavily from the coal shortage, and coal stockpiling must begin soon for next winter if another similar fiasco is to be avoided, it seems probable that "as soon as possible" will be very soon. The discussions will be of what is known in the jargon as tripartite, with the government sitting in council with the unions and the employers.

**I**N the recent press conference it was emphasized that the new planning board, which the government promised in the recent House of Commons debate on economic policy, will in the future furnish a regular channel for such three-power discussions. Sir Edwin Plowden, who had considerable wartime planning experience, has been appointed to coordinate the proposals of various ministries from an economic standpoint, and he is gathering a small staff which will represent both labor and management.

Thus the possibility of offering "continuous advice and criticism" will be available to everyone while plans are being developed. Whether the new appointment, Sir

Edwin, will prove to be sufficiently resilient to withstand a steady diet of "criticism, advice and help" which Sir Stafford Cripps is inviting in behalf of the former remains to be seen. Considering the wide divergence of viewpoints sure to be propounded, the chief planner will need considerable wisdom and careful judgment. And possibly one deaf ear might be an obvious advantage as well.

In answer to a need made obvious to journalists in recent weeks, an information department is also to be set up in connection with the new super-planning board, which press representatives here hope may make it somewhat easier to obtain information on the economic plans of Britain. This new board will tend inevitably to push more and more policymaking up to the cabinet level, where the board will be operating. At this level, there is only one press officer, who is the personal press representative of the Prime Minister. A new group will be concerned with putting out information concerning the economic plans which are developed in the future.

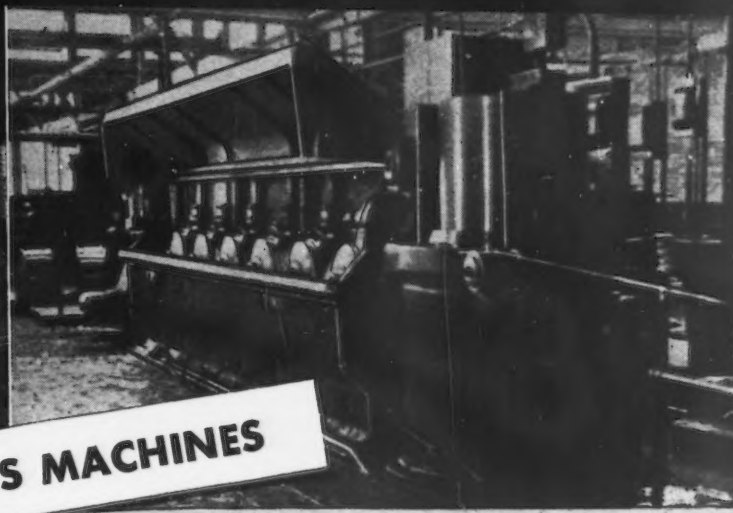
Concerning the coal picture, the Federation of British Industries pointed out that the basic tonnage figures do not present an accurate picture of the gravity of the situation. The quality of delivered coal has seriously deteriorated. The loss of calorific value compared with prewar is not less than 5 pct taking the country as a whole, equivalent to 10 million tons a year. The waste of manpower to handle this, of rail trucks to transport it, and of heat in attempting to burn it exaggerate the loss involved.

**I**N 1941, a labor force in the mines equal to today's produced 206 million tons of good quality coal. To this may be added an output of 10 million tons from opencast workings, for which the manpower is not included in the totals published for the mines. Since 1941 there have been significant increases in mine mechanization. Taking these fac-





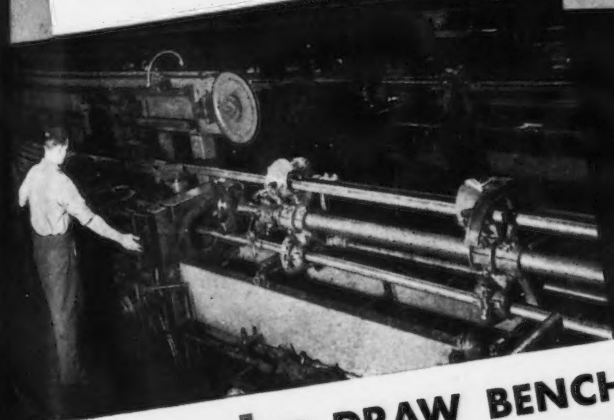
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tors into account, and allowing nothing for any output from the 35,000 increase in manpower which is planned by the government, there appears to the Federation to be justification for placing the target for the 1947 coal year at 220 million tons.

If this output can be obtained, and none of it has to be put to stock building, the whole outlook would be immeasurably brightened. Such a situation could be brought about if 10 million tons of coal were imported from U. S. or from South Africa. This is a step that need not be repeated if fuel is handled right next winter. The Federation points out that it would not recommend such a course if it were to reduce by a like amount the deliveries of coal for the relief of the stricken areas of Europe, but it is not convinced that that need be so.

It is emphasized that the case for importing coal is identical with the argument for importing fuel oil, which is accepted policy. Coal importation has, however, the additional advantages of avoiding the waste of labor and materials required by the conversion of plant, and of involving no long-term commitment.

The Federation calls a coal budget which involves the rationing of industry at present levels a policy of ruin. Following the demands by both parties for coal imports, Sir Stafford, in his somewhat backhanded manner, gave some additional information on the subject to his press conference. On the occasion of his first conference he had used his best attorney-at-the-bar technique to fend off would-be questioners on the subject, answering one question by posing another himself, good-naturedly ignoring the point at issue.

ON the occasion of the second conference he assumed a mildly hurt air, accused one or two newspapers of having misrepresented the facts concerning the delicate question of coal imports. He went on, obviously more adequately briefed this time on the subject, to lay out a few simple homilies which were at that moment being clouded with doubt by a slightly divergent view being voiced in the House of Commons

by the vociferous-when-permitted Minister of Fuel and Power.

According to Sir Stafford, Britain for obvious reasons does not want to import coal, but plans to do so as a temporary expedient, if supplies are available. Striking out from his prepared statement on the subject, he ventured the opinion that there would be some American supplies available, and that also some South African deliveries might be arranged if British exports to that country could be expedited. At the same time, Mr. Shinwell, the Minister of Fuel and Power was stating in a coal debate in the House that the prospects of getting any imports were dim. Obviously, what Sir Stafford needs to do to create the impression of a solid front is to repeat his performance of last January when he held a joint press conference with Mr. Shinwell, but let him speak in a whisper, when spoken to—by Sir Stafford.

It is the political implication of the coal importing program, even more than the dollar shortage, which makes the subject such a painful one. Despite all of the statements, it seems likely that some coal will be found from American exports to aid Britain.

The shortage of installed electric capacity, which caused the government so much embarrassment during the winter weather, also was the subject of some suggestions from the Federation of British Industries. Calling to mind the power stations which were built during the war in 2 years, the Federation questions the government view that 3 or 4 years are required to construct them today. To meet the emergency, it suggests that new designs be shelved and that existing stations be duplicated to achieve a maximum speed.

SIR STAFFORD stated that the production picture for heavy electrical generating equipment had been reviewed and "various steps have been taken which will, it is hoped, expedite the program." Questioned on this point, he added helpfully that the steps taken had mostly to do with getting the required raw materials to the right place at the right time.

One of the points made earlier by Sir Stafford was that it has

been impossible to estimate the amount of production losses due to the fuel shortage, as there was no guide to the amount of ingenuity that a firm might show in avoiding a shutdown. He demonstrated his point with the following example: In the case of one firm, immediately after a total cut was announced the directors met and formulated plans which were put into operation. All employees for whom no employment could be found received payment on the basis of a normal 40-hr week during the shutdown, to avoid the permanent loss of manpower. Fifteen farm tractors were obtained and used to drive line shafts. By this means they were able to achieve 40 pct production by the third day of the cut, working time being limited to the daylight hours. To enable shift work to commence, lighting generators were obtained, and in addition they were able to contact owners of Fairground Lighting Sets who at short notice arrived complete with generators, caravans and families, and lived in the works throughout the shutdown.

The whole of their 7-acre factory was rewired in 24 hr by their own staff to suit 110 v Fairground Lighting Sets, for which the existing lighting equipment was unsuitable. Immediately after power was restored they evolved a plan to reduce their electric load on the day shift. Their normal load is over 600 kw, and they inaugurated a 3-shift system, so arranged as to insure all heavy machinery being operated at night, achieving a saving of 50 pct or more electric load during the day and maintaining production at 100 pct with no load shedding since power was restored.

## Plans to Drill for Coal

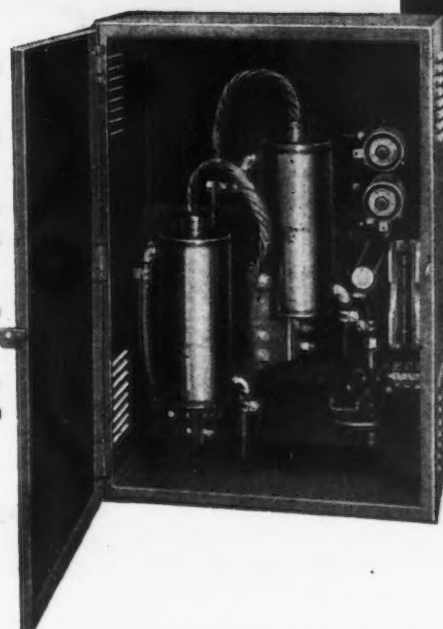
London

• • • The East African Engineering & Trading Co., which has been investigating coal in Rukwa Valley, Southwestern Tanganyika, for the past 25 years, states that a drilling program proposed by the Canadian geologist, M. McKeown, will be started as soon as the heavy rains cease. It is hoped to prove coal to a depth of 1100 ft and to produce over 18 million tons from the area.



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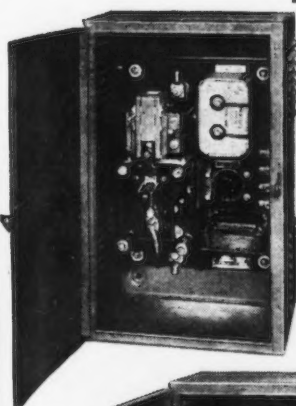


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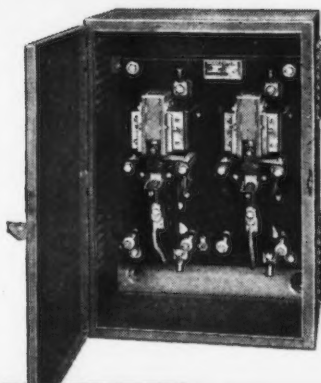
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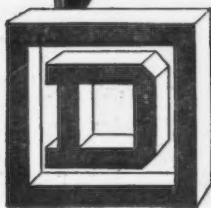
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# PERSONALS

• **Ross L. Leffler** has been made assistant to president, Carnegie-Illinois Steel Corp., Pittsburgh, a U. S. Steel Corp. subsidiary. Mr. Leffler started his service with the U. S. Steel Corp. in 1910 in the Duquesne Works, where he spent 25 years in various capacities. In 1935, he became director of industrial relations for Carnegie-Illinois Steel Corp. and was transferred to the Pittsburgh office. Later, after serving a brief period as special agent for the company, he was appointed assistant to manager of operations, Pittsburgh district, the position he held at the time of his present appointment.

• **Uno V. Johnson** has been named superintendent of the rod and wire mill department, Portsmouth Steel Corp., Portsmouth, Ohio. He was formerly superintendent of the wire mill, Wickwire Spencer Steel Co. **John E. Nordstrum** has been appointed chief metallurgist, rod and wire mill department, Portsmouth Steel Corp., and **James N. Van Cleave** has been made superintendent of production. Mr. Nordstrum was formerly assistant chief metallurgist and Mr. Van Cleave formerly assistant superintendent of production at Keystone Steel & Wire Co.

• **William A. Wood** has been elected vice-president and general manager of the Aetna Ball & Roller Bearing Co., Chicago. **A. E. Johnson**, comptroller, will succeed Mr. Wood as secretary of the company.

• **Edwin P. Corey**, after 52 years in the pipe business, has resigned as general manager of tubular sales, Youngstown Sheet & Tube Co., Youngstown, Ohio. He had held this position since 1923. Prior to this he had held various positions with the National Tube Co., having started with them in 1895. **G. W. Christopher** has been appointed manager of standard pipe sales and **J. W. Owings**, manager of oil country tubular sales, for Youngstown Sheet & Tube.

• **C. S. Hanley** has been appointed assistant to the president of the Pressed Steel Car Co., Inc., Pittsburgh, succeeding the late **J. J. Moran**.

• **A. J. Fischer** has been appointed manager of the carbide and cast alloy division of the Jessop Steel Co., Washington, Pa. He has been associated with the carbide industry for the past 12 years. He was employed by the Union Wire Die Co. from 1934 to 1936, then accepted a position with the Charles Hardy Co. doing laboratory work in powdered metallurgy at Columbia University. In 1938 he worked with the American Cutting Alloy Co. and in 1939 accepted a position as assistant to the supervisor of carbide production at the Firth-Sterling Steel Co. He joined the Jessop Steel Co. in 1947.

• **Harry C. Smith, Jr.** has been appointed acting district manager of sales in the Chicago district for Weirton Steel Co., succeeding the late **Kenneth M. Hunt**. Mr. Smith has been affiliated with Weirton since 1931, and has been working in a sales capacity in the company's Chicago office for the past 10 years.

• **Dr. C. E. MacQuigg**, dean of engineering at the Ohio State University, has been appointed a member of the consulting staff of the Taylor-Wharton Iron & Steel Co. of Easton, Pa.

• **J. Y. Scott, L. F. Hunderup, J. A. Wright, E. C. Adams, W. T. Read, R. W. Porter, L. H. Stanton, M. J. Rainey, and A. J. Snyder** have been elected to the board of directors of the Morse Twist Drill & Machine Co., New Bedford, Mass.

• **Col. Harry A. Toulmin, Jr.**, president and board chairman, Hydraulic Press Mfg. Co., Mt. Gilead, Ohio, has been elected chairman of the Tucker Corp., Chicago.

• **E. W. Bernitt**, plant engineer at Nash-Kelvinator Corp., Kenosha, Wis., has been appointed staff engineer to succeed **R. A. De Vlieg**, now vice-president in charge of manufacturing. Mr. Bernitt will be succeeded at Kenosha by **J. H. Mueller**, formerly assigned to the El Segundo, Calif. plant.



**ALBERT E. ZEISEL**, vice-president in charge of sales, Eutectic Welding Alloys Corp.

• **Albert E. Zeisel** has been appointed vice-president in charge of sales of the Eutectic Welding Alloys Corp. Mr. Zeisel became associated with the corporation in 1944 as a field engineer for Virginia and the District of Washington. The following year he was appointed regional manager of the Mid-Western area, and in 1946 he became assistant to the president in charge of sales, with his headquarters in the New York office. **W. Sigmundis** is now vice-president in charge of production, and **T. H. Leston** has been appointed chief engineer of the corporation's new New York plant.

• **George C. Floyd** has been appointed manager of operations, Thomas Steel Co., Warren, Ohio, succeeding **Herman A. Mentall**, who has retired.

• **John F. Wakeland**, formerly superintendent, has been named manager of the Alabama Foundry Co., Birmingham.

• **Ward Jenks** has been appointed manager of the forge blanks department of Crucible Steel Co. of America, Midland, Pa., works. Mr. Jenks has been connected with the company directly and indirectly since 1936 with offices in Detroit and has been instrumental in the development and sale of its Rollomatic products. In addition to his new assignment he will continue to direct the sale of these products, with offices both at Midland and Detroit.



## PERSONALS



**C. DONALD DALLAS** (left), chairman of the board, and **JAMES J. RUSSELL** (right), president, Revere Copper & Brass Inc.

• **C. Donald Dallas**, president of Revere Copper & Brass Inc., New York, has been elected chairman of the board of directors and **James J. Russell** has been elected president of Revere. Mr. Dallas will continue as chief executive officer. In 1908 he was associated with the organization of the Dallas Brass & Copper Co. of Chicago, of which he was secretary and treasurer, becoming president in 1918. Ten years later, at the time of its merger with the Revere Copper & Brass he was named first vice-president in charge of manufacturing and sales and director of the company. In 1931 he became president. Mr. Russell has been a director and treasurer of the company since its organization in 1928 and also for many years secretary and vice-president of the company. **Breck Aspinwall** has been elected secretary and **A. E. McCormick** has been elected treasurer. Both have been associated with the company for a long time. Mr. McCormick since its organization in 1928. **Charles A. Macfie**, for many years a vice-president of the company in charge of merchandise sales, has been appointed general sales manager. **Cornelius C. Felton**, a vice-president, has been appointed assistant to the chairman of the board.

• **Thomas J. Lawless** has been advanced from sales manager to vice-president in charge of sales of the Champion Rivet Co., Cleveland.

• **Waldemar Naujoks** has been elected president of the Bison Forge Co., Inc., Buffalo, where he will be associated as partner with David L. George. He is past chairman of Cleveland Chapter, American Society for Metals and past treasurer of Cleveland Technical Societies Council. Mr. Naujoks was formerly chief engineer of the Steel Improvement & Forge Co., Cleveland.

• **Alfred L. Hartung** has been appointed assistant sales manager of Cans, Inc., Chicago. Mr. Hartung was with the American Can Co. in Detroit, and was district sales manager of that organization prior to his recent appointment.

• **W. F. Taylor** has been made manager of the newly-created Allis-Chalmers Mfg. Co.'s general machinery New England division. He will make his headquarters in Boston.

• **Richard T. Frankenstein**, former vice-president of UAW-CIO, has been appointed to an administrative post with Allen Industries, Inc., Detroit.

• **Raymond F. Dauer** has been named assistant general works manager of York Corp., York, Pa. Prior to coming to York, Mr. Dauer was production manager of the West Lynn, Mass. plant of General Electric Co.

• **Alexander W. Lansberg** and **John S. Csaklos** have been elected vice-presidents of the Hartford Electric Steel Corp., Hartford, Conn. **Thomas M. Ecker** has been appointed assistant to the president and **Robert T. Clarke**, assistant secretary-treasurer. Mr. Lansberg joined the company as assistant treasurer in 1942 and has held the position of secretary and treasurer of the corporation since 1944. He will retain the position of secretary-treasurer in addition to that of vice-president. Mr. Csaklos, in addition to the position of vice-president, will retain the position of works manager he has held since joining the company in 1946. He was formerly foundry superintendent of Reading Steel Casting Co., a position he held for 18 years. Mr. Ecker joined the company in 1946 as assistant secretary and assistant treasurer. He was formerly office manager of Roxbury Steel Casting Co., a former subsidiary of the Hartford Electric Steel Corp. In his new post, Mr. Ecker will assist the president in the direction of company sales activities. Mr. Clarke joined the company in 1946 and was formerly assistant treasurer of Roxbury Steel Casting Co.

• **Don C. Miller** has been appointed manager of the organization and analysis department of Packard Motor Car Co., Detroit. Mr. Miller was associated with a large advertising agency before the war. In 1942 he became promotional specialist on war bond sales for the U. S. Treasury, and later entered the Navy.

• **J. F. Bachman** has been appointed director of Ford Motor Co.'s industrial and marine sales department, Dearborn, Mich. He has been chief engineer of the Chrysler Marine & Industrial Engine Div. since 1943.

• **Guy Berghoff**, director of public relations for Pittsburgh Plate Glass Co., Pittsburgh, will assume direction of all the company's advertising activities. He joined the firm in 1934 as assistant manager of glass advertising and promotion and served in that position for 10 years prior to his appointment as director of public relations.

• **Paul H. Holton** has been appointed manager of the Atlantic district office, Newark, N. J., of Carboloy Co., Inc. Mr. Holton, who has been a sales engineer in the Philadelphia area of the company since 1937, succeeds **T. D. MacLafferty**, who has resigned. **Paul Schick**, who has been with the Carboloy Co. for the past 5 years and recently attached to the Carboloy training course at the Carboloy plant in Detroit, has been appointed to succeed Mr. Holton at the Philadelphia branch.

• **Arthur E. Kallinich** and **David J. Post** have been elected vice-presidents, and **Andrew J. Rebmann** has been elected assistant treasurer of Veeder-Root Inc., Hartford, Conn. Mr. Kallinich joined the Root Co. in 1912, where he held successively various positions leading up to his appointment as field sales manager shortly after the incorporation of Veeder-Root Inc. in 1928. He was made sales manager in 1944. Mr. Post joined the Veeder Mfg. Co. in 1926 in the sales department, and became assistant sales manager shortly after the consolidation in 1928. In 1944 he was appointed assistant to the president. Mr. Rebmann joined Veeder-Root Inc. in 1936 as a junior accountant, and has subsequently held the positions of statistician and executive assistant.

• **Jack A. White**, former application engineer on air conditioning with the Carrier Corp., and previously research engineer with Falk Corp., has joined Remington Corp., Cortland, N. Y., to establish a new export service.

• **Ambrose J. Wardle**, president and treasurer, McKay Machine Co., Youngstown, Ohio, has been named chairman of the board. **Harvey D. Miller**, secretary of the company, succeeds Mr. Wardle as president. Mr. Miller will also serve as treasurer. **R. J. Miller**, vice-president of McKay Machine, has been named vice-president and vice-chairman, and **D. M. Davis**, formerly assistant secretary, has been named secretary. **Ambrose J. Wardle, Jr.** and **C. J. Honen**, sales engineers, have been named assistants to the president.

• **Joseph P. Flynn** has been appointed north central regional manager of the Crosley Div., Avco Mfg. Corp., Cincinnati. Mr. Flynn, whose headquarters will be in Milwaukee, will cover Wisconsin, Minnesota, North and South Dakota and parts of Michigan and Illinois. Since 1945 he has been appliance merchandise manager of Leath & Co., Chicago.

• **Richard L. Jackson**, who became associated with the company in 1946 as assistant treasurer, and **Fred S. Middleton**, formerly works manager of the production foundries division, have been made vice-presidents of Jackson Industries, Inc., Birmingham.

• **J. C. Ryan**, former general manager of the signal battery division, Ray-O-Vac Co., Madison, Wis., has been elected president of the Blake Mfg. Co., Clinton, Mass., a subsidiary of Ray-O-Vac. Mr. Ryan will continue as vice-president in charge of the Ray-O-Vac lighting division.

• **John Dykstra** has been named general production assistant to **D. S. Harder**, vice-president, operations, Ford Motor Co., Dearborn, Mich. Mr. Dykstra's experience in automotive manufacturing dates back to Clayton-Lambert Mfg. Co., which later became the Hudson Motor Co. In 1934 Mr. Dykstra began a 13-year career with the Oldsmobile Div. of General Motors as superintendent of sheet metal and in 1939 was named general superintendent and assistant factory manager. In 1941 he became manufacturing manager and held this post until coming with Ford.

• **Lawrence W. Guild** has been appointed manager of a new district for Kennametal Inc., the New England district comprising territories covered by the Kennametal Hartford, Springfield, and Boston offices. Mr. Guild has served Kennametal Inc. for several years as a representative and tool engineer. His headquarters will be at the Springfield, Mass. office.

• **Kenneth W. Stookey** has been elected president of the Gas Machinery Co., Cleveland. Mr. Stookey has been affiliated with Gas Machinery for the past 18 years and has served as vice-president for the past 3 years. **William E. Steinwedell**, president of Gas Machinery Co. since 1928 and one of the founders of the company, has been elected chairman of the board of directors. **Joseph C. Calhoun, Jr.**, who has been a vice-president of the company, has been elected secretary. He continues as a vice-president.

• **Henry Ford**, 83, founder of the Ford Motor Co., Dearborn, Mich., in 1903, died Apr. 7.

• **Robert R. Tanner**, 51, president of the Tanner Chemical Co., Detroit, died Mar. 30. He was an assistant professor at University of Michigan and later was director of research for the Parker Rust Proof Co.

• **Kenneth M. Hunt**, Chicago district sales manager for Weirton Steel Co., died on Mar. 26. Mr. Hunt has been district manager at Chicago since 1939.

## ...OBITUARY...

• **Albert Haeger**, 70, manager of the Atlas Iron & Wire Works, Inc., Milwaukee, died Apr. 1 after a short illness. He formerly was president of the Badger Wire & Iron Works at Milwaukee.

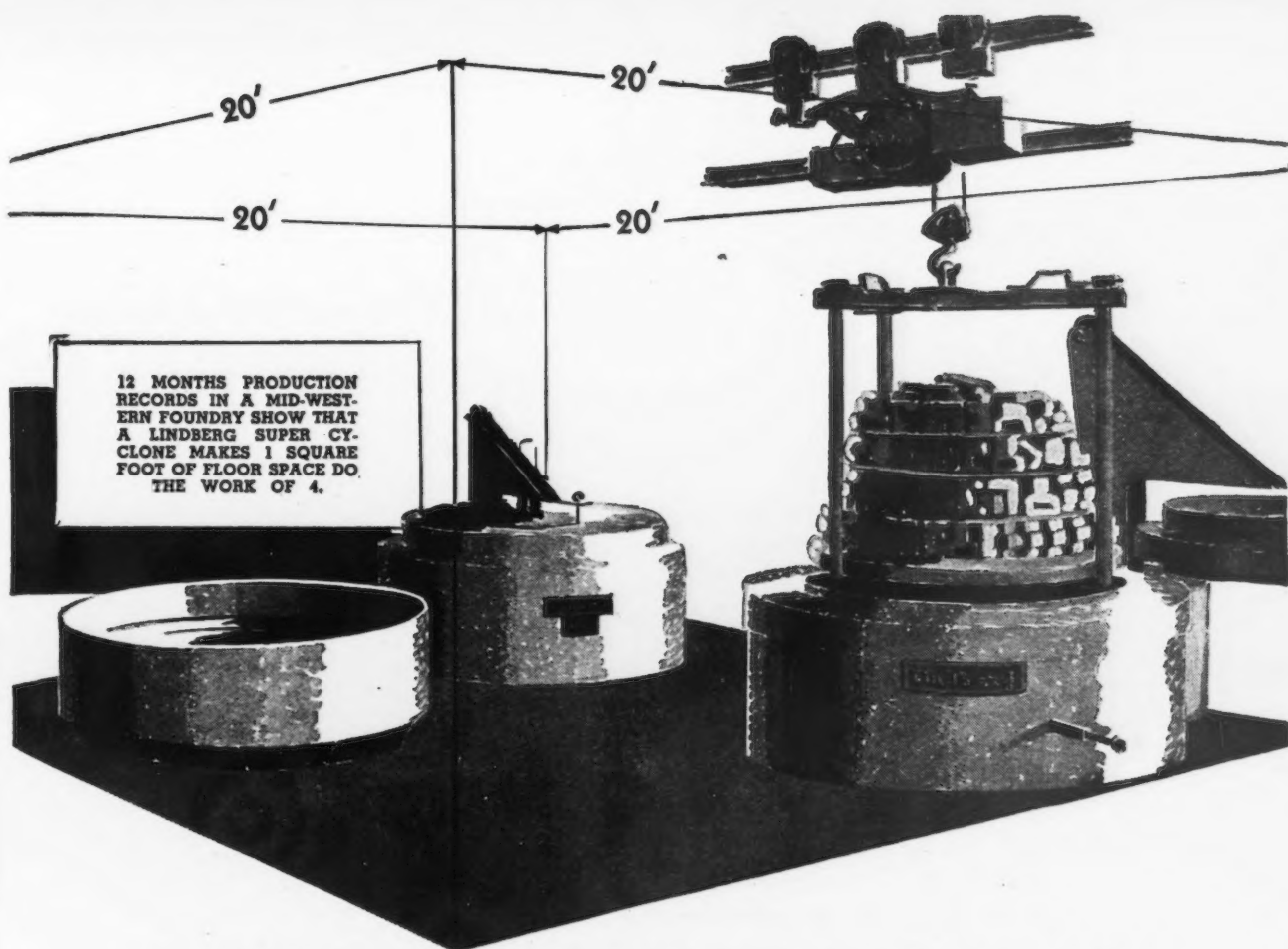
• **William H. Palmer**, 77, former sales manager of U. S. Rubber Co., with headquarters in Boston, and production manager of the company's Naugatuck plant, died Apr. 4. He retired in 1931.

• **Philip G. Franklin**, 53, owner and president of the Young & Franklin Tool Works, Liverpool, N. Y., died Apr. 1 after a long illness.

• **Peter W. Smith**, 62, roll shop foreman, Acme Steel Co., Chicago, died Mar. 16. Mr. Smith started with Acme Steel in 1922, where he served for 25 years as roll designer.

• **Herman Fradis**, who was associated with Schiavone-Bonomo Corp., Jersey City, N. J., since 1929, died on Apr. 4.

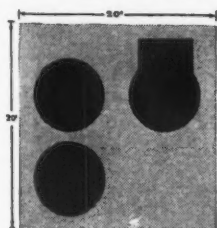




## HOW YOUR HEAT TREAT DEPARTMENT WILL PRODUCE 4 TIMES MORE PER SQUARE FOOT OF FLOOR AREA!

Are your heat treating requirements increasing? Do you have to increase your output—without using more floor space? Consider the Lindberg Super Cyclone! The production rec-

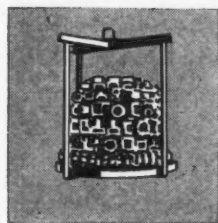
**200 TONS MONTHLY IN 20' BY 20' AREA**



48" by 48" Super Cyclone installation which includes insulated cooling pit, quench tank, and loading space, normalizes in only 400 square feet of floor space, as much work as a conventional car type furnace, requiring 1530 square feet in same plant.

### MINIMUM HANDLING

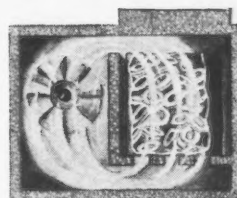
Castings are loaded away from the furnace on fixtures or in work baskets. This method of handling improves working conditions for the heat treater, as loading and unloading is done away from furnace heat.



ords for a period of twelve months in a mid-western foundry show that a Lindberg Super Cyclone makes one square foot of floor space do the work of four.

### FORCED CONVECTION HEATING

The Super Cyclone produces more work because heat is blown through and around every part of the charge. A powerful blower fan does the job quickly,—and gives accuracy of heating never before obtained in production heat treating. Accurately heated air is forced to the center of the charge as well as to all other portions,—therefore nothing lags. No overheating of outside and underheating of middle. Every casting is heated alike.



Because of the forced convection principle, quick and controlled cooling is easily accomplished.

**LINDBERG ENGINEERING CO.**  
2452 West Hubbard Street, Chicago 12, Illinois

Write for the 8 page bulletin No. 130,

"Lindberg Super Cyclone"

# LINDBERG FURNACES

# Dear Editor:

**ALUMINUM NAILS**  
Sir:

We noticed in your Mar. 20 issue, under Newsfront, that there are now ten nail producers in the field making aluminum nails on standard nail making equipment. We would appreciate your advice as to the names of these producers.

**R. H. BELL**  
Assistant Manager,  
Merchant Trade Div.

Ceco Steel Products Corp.  
Chicago

● Present manufacturers of aluminum nails are listed in the article, "Aluminum Nail Seen New Factor in Special Purpose Field," appearing in the Mar. 27 issue. Tear sheets of the article are being forwarded.—Ed.

## JOB EVALUATION

Sir:

Would it be possible to get two reprints of your recent series on job evaluation. We read your articles with considerable enthusiasm and find we could use a set of them in our plans for revising our setup.

**FRED G. HOBBS**  
Production Engineer

Delco Products  
Dayton

● "Techniques and Time Study—Incentives and Job Analysis," a series of four articles by David Anderson and A. H. Hansen, is available to readers at 60¢ a copy. Copies have been mailed to you. "Job Evaluation Scales," an article appearing in our Oct. 10 issue, may also be of value to you.—Ed.

## PERMEAMETERS

Sir:

We would appreciate it if you would advise us the makers of the Fahy-Simplex permeameters and a firm in a position to supply such apparatus.

**MARIO LIGUORA**  
Acciaierie E. Ferriere Lombarde Falck  
Milano, Italy

● Frank T. Fahy Co., New Rochelle, N. Y., manufactures the permeameter.—Ed.

## FOREIGN PATENTS

Sir:

Will you please send me a list of foreign patents and literature confiscated by the government on the subject of heat resisting alloys with special emphasis on oxidation resistance. Has the Office of Technical Service issued any reports concerning the above subject?

**BYRON ZOLIN**  
Metallurgist, Engineering Dept.  
Hotpoint, Inc.  
Chicago

● A list of foreign patents can be obtained from the Office of Alien Property Custodian, Chicago. The Office of Technical Service, Dept. of Commerce, Washington, has made available various reports on heat resisting

alloy developments in Germany. OTS has published a general bibliography of reports on all subjects covered which can be obtained by writing directly to them. "German Wartime Technical Developments" which reviews OTS reports of special interest to our readers, is a periodic feature of THE IRON AGE. Following this feature will keep you advised of the type of material available from OTS.—Ed.

## THERMOCOUPLE LEADWIRES

Sir:

Please send us tear sheets on the article entitled "Selection and Installation of Thermocouple Extension Leadwires" which appeared on p. 82-84 of the Mar. 6 issue.

**RICHARD WACHTELL**  
Junior Engineer,  
Technical Services

Air Reduction Sales Co.  
Jersey City, N. J.

## LOST WAX PROCESS

Sir:

Please supply us with one copy of "Precision Casting-Lost Wax Process."

**G. H. CAPE**  
Treasurer

Frost & Wood Co., Ltd.  
Smiths Falls, Ontario

● The booklet, "Precision Casting — Lost Wax Process," contains 12 articles that we have published on precision casting. Copies are available to readers at \$1 each.—Ed.

## ELECTROPOLISHING METALS

Sir:

We would appreciate receiving tear sheets of the article, "A New Method of Electrolytic Polishing of Electron Microscope Samples" by E. Der Mateosian, appearing in the Jan. 16 issue, p. 51.

**RALPH H. HOPP**  
Technical Librarian  
Battelle Memorial Institute  
Columbus, Ohio

## VACUUM MELTING

Sir:

This office would like to obtain tear sheets of the article from your Dec. 12 issue by George T. Motock entitled, "Vacuum Melting in Germany."

**F. W. SIMPSON**  
Technical Librarian  
Research Div., Field Operations  
U. S. Atomic Energy Commission  
Oak Ridge, Tenn.

## STEEL BARS STATISTICS

Sir:

I am anxious to get any statistics that are available on cold-rolled steel bars, by states. Do you have such information, or if not, could you tell me where they might be attainable. . .

**MELVIN J. EVANS**  
Melvin J. Evans Co.  
Chicago

● We have no statistics on cold-rolled steel bars by states and to our knowledge no such

data exist. However, we are mailing you a reprint of the article, "Steel Use by States," which appeared in the Jan. 2 issue, and which gives an overall breakdown of steel use, but does not give data on specific finished steel products.—Ed.

## X-RAY DIFFRACTION ANALYSIS

Sir:

Please send me a reprint of the article on p. 44 of the Jan. 23 issue, entitled "X-Ray Diffraction Analysis of Cold Work Produced by Face Milling." This would be very beneficial in my work.

**H. MARVIN**  
Chief Cutting Tool Designer  
Packard Motor Car Co.  
Detroit

## REQUEST FROM RUSSIA

Sir:

In the issues of Oct. 3, 17 and Nov. 28, 1946, were a series of articles describing spot tests. May I ask you to send me tear sheets of these articles?

**MYRON ACKLAND**  
Sverdlovsk, U1. Shenkmana  
U.S.S.R.

● Tear sheets of the articles, "Semi-quantitative Tests for Moly in Steel" and "Spot Testing for Aluminum" by W. E. Thrun and C. R. Heidbrink, and "Quick Methods for Identifying Metals" by J. E. Garside have been forwarded.—Ed.

## SURFACE FINISH CONTROL

Sir:

Will you kindly forward three copies of the article entitled "Practical Aspects of Surface Finish Measurement Instrumentation" by J. A. Broadston, as published in the Mar. 20 issue.

**H. J. PETERSON**  
Chief Tool Engineer  
Bell & Howell Co.  
Chicago

## OPENHEARTH SLAGS

Sir:

Let me congratulate you on the interesting and timely article, "Basic Openhearth Slags" by Mahaney and Feters appearing in the Mar. 6 and 13 issues. It will be appreciated if you are able to send a reprint or tear sheets of this article.

**FRANK G. NORRIS**  
Statistical Metallurgist  
Wheeling Steel Corp.  
Steubenville, Ohio

## DESIGNING A NEW PRODUCT

Sir:

I would appreciate it if you could send me a tear sheet of the article by George K. Hendrick of Chicago, entitled "So You're Designing a New Product!" which appeared in the Oct. 31 issue.

**F. I. LACKENS**  
Advertising Manager  
Hays Corp.  
Michigan City, Ind.



# MULTI-PURPOSE Wheelabrator Swing Table

Replaces the  
Airblast Room  
—handles at least 80%  
of this class of work.

Handles wide range  
of work—for shops desiring  
a versatile machine.

Hygienic—the operator  
works outside the cabinet.

Airless—for faster, cheaper,  
more efficient cleaning.

Saves power, labor, space

This machine disposes of the slow, high cost, unhygienic disadvantages inherent in Airblast Room operation. Equally important is the fact that the machine serves admirably as a versatile, general purpose unit for the shop requiring a single moderately-priced equipment capable of handling work of a wide variety of shapes, sizes, and weights.

Opening the door of the machine brings the work table into position for loading or unloading. Closing the door brings the rotating table beneath one or more airless Wheelabrator blast units.

By combining Wheelabrator speed cleaning with the versatility of the Swing Table we have developed a moderately priced machine of broad usefulness that meets present day requirements for speed and economy of production.



Swing Table Catalog  
214-A now available.  
Graphically describes 5  
sizes, speed, economy,  
and diversity. Write  
for free copy today!



## American

WHEELABRATOR & EQUIPMENT CORP.

(FORMERLY AMERICAN FOUNDRY EQUIPMENT CO.)

510 S. Byrkit St., Mishawaka, Indiana

# Industrial News Summary...

- **Steel Picture Continues Dark**
- **Action Must Be Taken Next Week**
- **Scrap Market Slides Down Further**

**N**OTHING has happened in the past week to change the serious steel labor outlook—nor are any new developments of an optimistic nature expected this week. Meetings between steel firms and the steel union, held occasionally since the middle of January, have produced nothing.

The U. S. Steel Corp. was still insisting this week that the portal question must be legislated satisfactorily before any wage commitments could be made. The union so far has named no definite wage demand except to ask for a substantial increase. The steel firm has at no time made a wage offer. This fussing around is expected to be eliminated by the beginning of next week when both sides will be forced to attempt to do in 10 days what could have been done in the past 3½ months.

Mr. Murray by next Monday, Apr. 21, will have received the authority from his strategy committee, representing all steel workers, to call a strike for May 1 if efforts to obtain a wage increase fail. Unless conditions change radically from what they are this week, it is a 50-50 chance that the steel industry will be shut down by a strike.

**T**HE contract settlement between General Motors and the Electrical Workers going for 15¢ an hr raise which includes a straight 11½¢ an hr increase plus 3½¢ an hr to take care of paid vacations may have some influence on the final steel settlement.

One factor in the current steel situation which the union is expected to pounce upon will be the steel earnings report of U. S. Steel Corp. for the first quarter of this year. These figures which will show quite an increase from fourth quarter net income are expected to be announced on Apr. 29. Steel officials insist that the showing for one quarter is insufficient time on which to base permanently higher wage rates.

This week steel sales people were considering the possibility of a drop in steel demand by the end of this year with a consequent decline in the operating rate to a level below current output. There is also fear in some quarters that the steel price structure may not withstand a severe testing when supply begins to outrun demand. It is for these reasons that talk of lower steel prices now accompanied by a substantial wage increase is only in the talking stage. Most steel officials believe that earnings in the first quarter of this year will have no bearing on the year's labor costs and that they should not be taken as a reason for a much higher wage rate.

**N**ONE of this opinion is shared by Mr. Murray who is expected to score heavily with the public when the steel earnings report is announced. He

can point to the fact that the union agreed to a contract extension for a longer period than has ever been done before, and also point out that so far no offer of a wage increase has been made by the company. Between the middle of this week and the middle of next week there is a chance that higher officials in the Steel Corp. may take over negotiations. Such a step was taken during the labor controversy in 1946.

Neither side wants the intervention of the Government in the present steel wage deadlock. With the administration's future at stake, the Government will definitely be in the picture unless Mr. Murray and the Steel Corp. can reach some settlement before May 1.

Some steel officials last week were more interested in the possibilities later on this year of a buyers' strike rather than a workers' strike. This frame of mind exists this week despite the heavy volume of steel orders now rolling into the mills. Sales officials report that orders this month were greater in number and tonnage than a month ago. Volume so far this year was also running ahead of the same period a year ago. This optimistic news is tempered by the recollection that steel consumers, by turning away from new orders and living off inventories, have a way of quickly reducing steel order backlogs—this is what happened in the fall of 1937 and the spring of 1938.

**T**HE scrap market, sometimes accepted as a sensitive barometer of things to come, slid off further this week. Prices for heavy melting steel declined at Pittsburgh, Philadelphia, Cleveland, Youngstown, New York, Detroit and Buffalo. THE IRON AGE steel scrap composite price this week was \$34.75 a gross ton, down 67¢ a ton from last week's level of \$35.42. A more severe test of scrap prices is expected next week when many old high priced orders will have been completed. The possibility of a steel strike, the high level of pig iron output and better scrap shipments are all having their effect on the downward trend in scrap prices.

The steel ingot rate this week declined one point to 94.5 pct of rated capacity. This decline was not significant and represents a normal fluctuation to be expected when the level has been maintained at such a high rate.

The expected decreases in the extras of some wire and wire products were to have been announced this week. While savings will not be as great as those recently announced for bars and plates, the net savings to all consumers of these products may amount to several million dollars on an annual basis. Extra changes on pipe and tubular products are expected sometime next month.



• **STEEL WAGES**—Combined steel industry wages and salaries for the first 2 months of this year are estimated at \$295,260,000 as compared to \$169,890,500 paid during the similar interval of 1946 says American Iron & Steel Institute. Total employees during February increased to 606,700 workers, of whom 517,500 were wage earners. In January, 1947, total employment was 601,200 workers, of whom 512,600 were wage earners. These workers received \$139,482,000 in wages and salaries in February, as compared with \$155,778,000 in the 31-day month of January. Of these payments, wages represented \$110,294,000 and \$126,083,000, respectively. During February, average hourly earnings of the industry's hourly, piecework and tonnage workers declined to \$1.370 from the January record of \$1.381. Average hours worked by wage earners during February totaled 39.0, as compared with 40.3 in January.

• **MONNET PLAN COMPROMISE**—Due probably to the shortage of fuel, the first quarter production program for the French steel industry reflects a reduction of 75,000 metric tons from the requirements specified by the Monnet Plan (see THE IRON AGE, Jan. 30, 1947, p. 114). The total output for the first quarter of this year is 1,475,000 tons, compared with 1,550,000 tons which would have been required to achieve the minimum of 6.2 million metric tons for 1947. The distribution pattern specified by the government remains much the same as for the last quarter of 1946, with slight reductions for the power industry and a small increase in exports.

• **SCRAPPED AUTOS**—R. L. Polk & Co., estimates that only 786,866 passenger cars were scrapped between 1944 and 1946, against a normal scrappage of more than 2 million cars annually. Polk figures show that as of Dec. 31, 1946, there were 25,142,527 passenger cars and 5,067,065 trucks registered in the United States. At the end of 1941, 28,968,114 passenger cars and 4,838,378 trucks were in use, Polk said.

• **CAR FACTORY SALES**—Passenger car factory sales during February totaled 266,237 units or 8 pct above the January figure. Total truck and coach sales during February were 107,550, a 5 pct increase over January sales of 102,332. Total passenger car, truck and coach sales during February exceeded the January total by 7 pct, aggregating 373,787.

• **EMPLOYMENT DATA**—Nonagricultural employment at mid-February was 39,386,000, about the same as in January, according to the Bureau of Labor Statistics. The trend in manufacturing was definitely upward. The largest gains between January and February occurred in the durable goods industries where the auto industry alone added 33,000 workers. The iron and steel and heavy machinery industries added 24,000 workers to their pay rolls. The increases in these industries accounted for the major portion of the 66,000 workers added to manufacturing payrolls during the month. Construction and trade continued to decline as a result of unfavorable weather conditions and other seasonal influences.

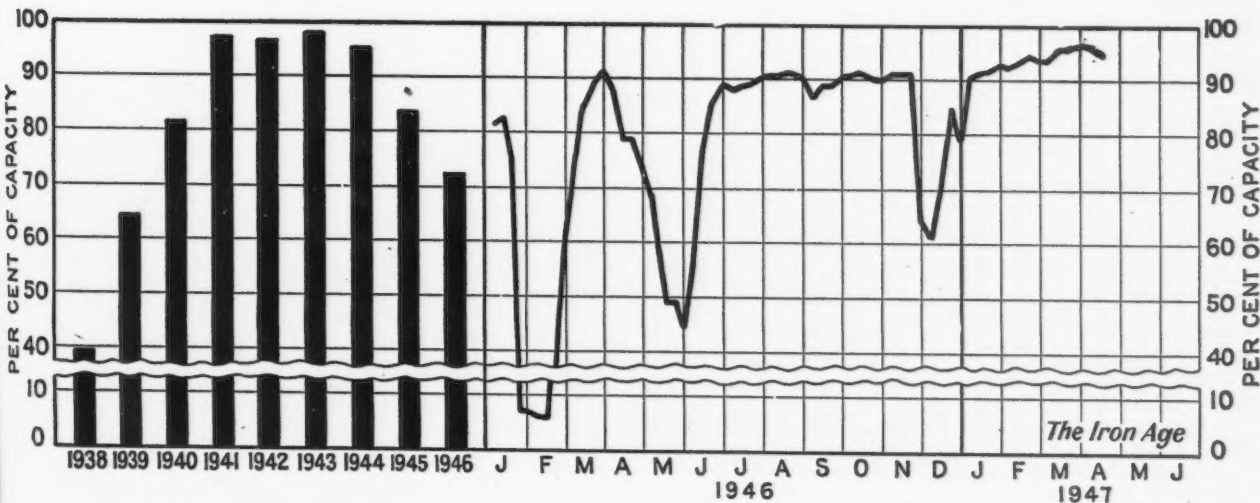
• **BRITISH AUTO OUTPUT**—Britain's automobile output slumped in February owing to the coal crisis. Only 9921 motor cars were produced during the month, against 25,005 in January and 26,827 in December. Production for export fell from 11,475 in January to 4600 in February. Figures for commercial vehicles show a similar decrease. The February output totaled 5792, compared with 13,159 for the previous month. Production for export dropped from 4068 to 1510.

• **WIRE NAILS AND STAPLES**—Shipments of wire nails and staples during January at 77,480 net tons set a record, according to the American Iron & Steel Institute. The rate was equivalent to annual shipments of over 910,000 tons, exceeding all previous peacetime and wartime rates. Bale tie shipments were 9,810 tons in January. Woven wire fence shipments were 35,591 net tons in January.

• **STEEL OUTPUT RECORD**—During the first three months of 1947, steel production set a peacetime record. Output then was 20,919,055 tons, almost double the production for the first quarter of 1946, according to the American Iron & Steel Institute. The steel rate was 93 pct of capacity. March output, at 7,284,516 net tons, set a peacetime record. The February production was 6,421,862 tons.

• **TCH, TCH, TCH**—While permission to use tin for beer cans has been effective less than four months, production has been increasing steadily, for city refuse departments are beginning to complain. The nation's capital reports that the return of beer cans has upped trash collections 5 pct.

Steel Ingot Production by Districts and Per Cent of Capacity



\* Revised.

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## Public Confusion Over Steel Prices Laid to Lack of Understanding

### New York

• • • Widespread public confusion over the steel price situation has been caused by inadequate reporting of trends on the part of those unfamiliar with basic aspects of the steel industry. The latter has been compared with other industries and price schedules when no actual comparison is warranted. This is the opinion of most steel officials who have been queried on the question.

The daily press mixup recently where base prices and extras were indiscriminately lumped together was the major reason for a flat statement by B. F. Fairless, U. S. Steel Corp. president, that the adequacy or inadequacy of a price cut could not be considered until

### Steel Officials and Consumers Look for Some Price Change Trends by End of Year

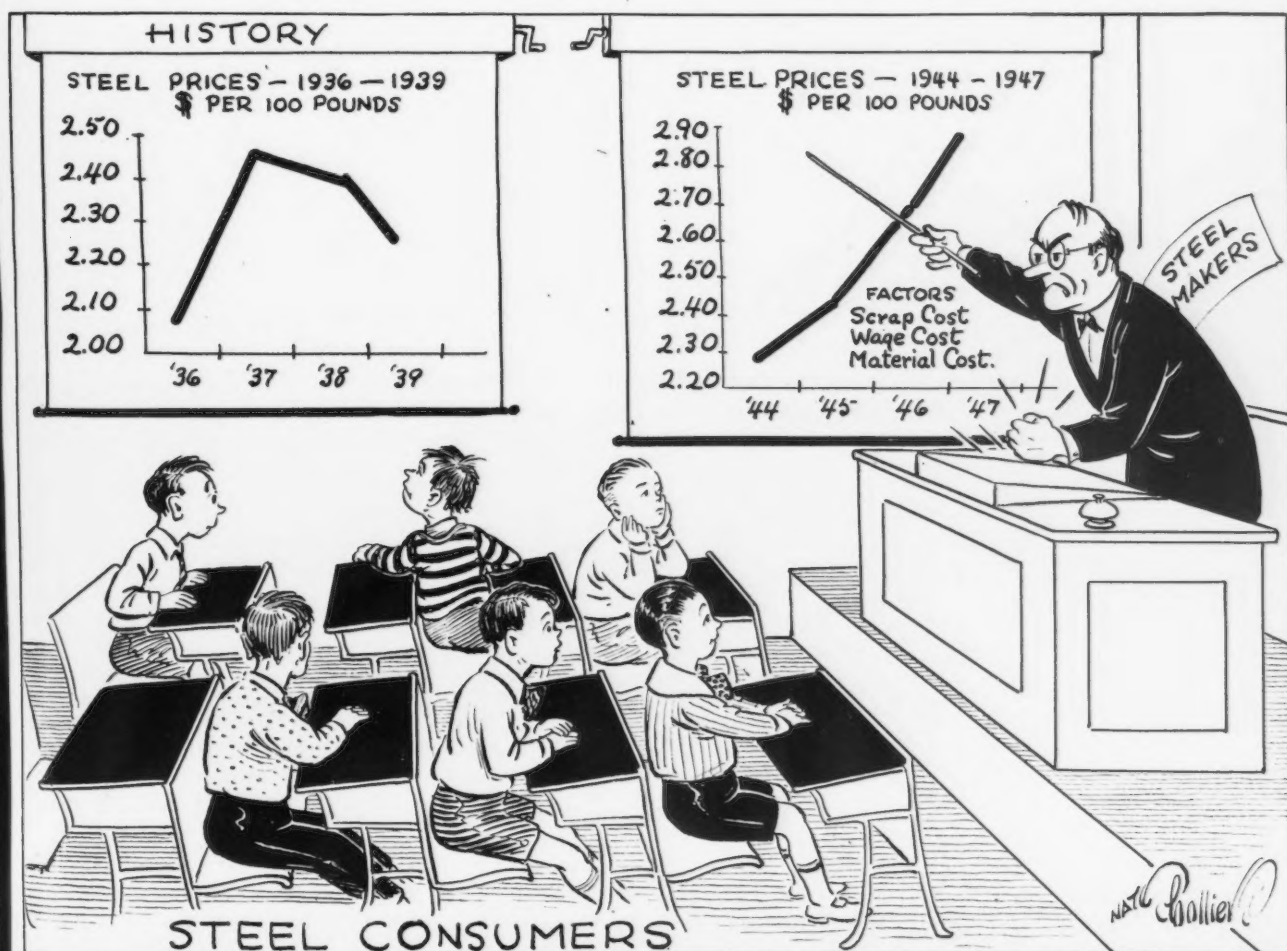
By TOM CAMPBELL  
News-Markets Editor

wage negotiations were completed.

Steel consumers and steel officials have been aware for some time that steel prices are higher than either would like to see. Whether or not an official reduction should be made is beside the point, according to some major consumers. The latter feel that

when competition becomes keener in the industry and that when supply exceeds demand, prices will decline as a result of the law of supply and demand. That time has not come yet, according to spokesmen for both sides.

Other steel sources have privately claimed that not only were base prices of some items too high but that extra charges were unreasonable in some cases. Already some extra charges have been reduced to eliminate those which have no basis when viewed from actual production costs. More changes are expected—officially. Steel users know from experience that chiseling on extra charges always occurred in a strong competitive market, when demand has



"Jimmy, this is NOT a History Class!"

suffered a sharp drop and when backlogs have been greatly reduced.

Under current conditions some steel officials claim that the past is not always a good criterion for what may happen in the future. By this they may mean that given the proper circumstances, steel base prices could be reduced before an intense competition forced them off. In such periods in the past, price declines have been drastic and steel companies have suffered severely because of the snow-balling effect in the downward spiral. Even more important has been the drop in employment in the past caused by reduced operating rates as steel consumers stood on the sidelines waiting for deeper cuts.

There is a firm belief among some steel officials that an important decline in basic steel prices would occur tomorrow if the union were to forego any wage increase at all. This opinion is not so world-stirring, however, since steel price increases made recently anticipate to some extent a wage increase. These same sources also believe that there is a strong possibility of the leading steel company making a token price reduction should the wage increase to come be of a moderate nature—say less than 10¢ an hr.

Since neither of the above possibilities is likely to occur the problem of whether or not base

steel prices are to be reduced cannot be determined until all of the facts are in. If at that time the wage cost is much less than had been anticipated and if the public pressure for reductions remains at white heat and if a buyers market appears to be coming faster than most steel officials had believed, there may be a definite downward movement in the base price of some steel products.

Such a move by the U. S. Steel Corp. would be precedent-breaking, but conditions today in the steel industry are far different than they were in the thirties. Since the union has become strongly entrenched in steel, the affairs of the industry have been and will continue to be front-page news. It is for that reason alone that some steel producers and consumers continue to look for price action. It is also that feeling by those people which causes periodic reports in the daily press implying the probability of a price reduction.

Steel price history would indicate that a price reduction is coming by the end of '47 or in the early part of '48 whether it is done officially or whether it is brought about by a price-cutting spree. Most steel sales research men know that steel consumers have long memories. They also believe that a steel price correction is a foregone conclusion. They don't know for sure when it will

come. But they don't think that when it does come it will be the drastic spiral usually associated with a major depression.

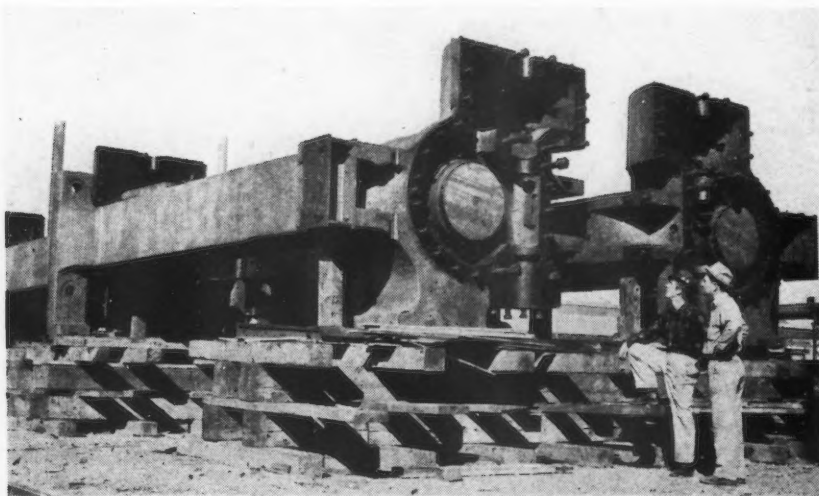
Most observers believe the steel price pattern to come may follow the one of 1936 to 1939. In 1936 THE IRON AGE composite price of steel was \$2.08 a 100 lb. The average price in 1937 was \$2.46 per 100 lb, an increase of 18 pct from the average 1936 level. For the year 1938 the composite declined to \$2.39 per 100 lb and by 1939 the downward movement which began in the middle of 1938 had about run its course.

The average finished steel price in 1939 was \$2.26 per 100 lb; 9 pct higher than the average 1936 price. Between the fall of 1937 and the middle of 1939 one-half of the price increase which occurred between 1936 and the second quarter of 1937 was eliminated by a price competition battle.

In 1944 the average price of finished steel was \$2.28 per 100 lb. By 1945 the average had climbed to \$2.42 per 100 lb or an increase of 6 pct over the 1944 average. In 1946 when the government allowed an average \$5 ton increase the index for that year climbed to \$2.67 per 100 lb or an increase of 18 pct over the 1944 level. Last week the composite price of finished steel was \$2.86 per 100 lb or 25 pct higher than the 1944 average and 26.5 pct higher than the average price in 1939.

In addition to the changes in the base price of steel, however, have been substantial advances in steel extras which were made effective in December of 1946 and January of 1947—changes which are not reflected in the base price of steel or in the composite finished steel prices. On a percentage basis price increases in the steel industry have been far less than in many other major industries. Steel officials insist that, when compared with other prices steel quotations are not out of line. They also say that high labor rates must be supported by high prices when it is impossible to predict how long the industry can maintain operations at above the breakeven point. They claim everyone loses sight of what happens to earnings when the operating rate drops—they fall faster and deeper than the decline in steel output.

**STEEL TO COME:** *The West Coast's steel sheet problem gets nearer to solution as Columbia Steel Company's new cold reduction mill facilities take shape at Pittsburg, Calif. These are two of 10 steel housings weighing 100 tons each for the five-stand, four-high sheet and tinplate mill which will have a capacity of approximately 500,000 tons per year. Completion of the mill, delayed by difficulty in procurement of motors and other components, is expected during the last quarter of 1947.*





## Alcoa Signs AFL Contract Granting a 10c Wage Increase

### Pittsburgh

• • • The new contract and new wage agreement between the Aluminum Co. of America and the Aluminum Workers Union-AFL, calling for a 10¢ per hr wage increase, is the first major basic metal producing contract settled during the present wave of contract negotiations. The contract, effective Apr. 9, will run for 2 years, while the wage agreement, which is effective for the payroll period of the first week in April, is of indefinite length and can be reopened at any time.

The contract settlement and the wage agreement followed a series of meetings started some two months ago between the company and the union. The contract provides for maintenance of membership along with several unnamed "substantial improvements in the working rules."

Approximately 8000 Alcoa employees at the Alcoa plants in East St. Louis, Ill.; Lafayette, Ind., and Massena, N. Y., are covered by the settlement. The East St. Louis plant is an ore refining and ore products operation; the Lafayette plant is an extrusion plant; and the operation at Massena includes the reduction of aluminum and its fabrication into rods, wire, bars and rolled products.

While the Alcoa-AFL agreement is held to be no criterion of what may occur in the negotiations of the Aluminum Co. and the steel industry with the USWA, it does follow closely the pattern of wage increases started by the CIO rubber workers, who 3 weeks ago made an agreement with the rubber companies for an 11½¢ an hr wage increase. On Apr. 14 General Motors Corp. settled with the United Electrical, Radio and Machine Workers of America, CIO, for a 15¢ an hr increase. Of this 11½¢ is a direct increase, 3½¢ is for vacations and other benefits.

The CIO - United Electrical Workers, negotiating with Westinghouse Electric Corp. for a new contract, have recessed and no date has been set for another

### Covers 8000 Workers in Three Plants; CIO Agreements Are Still Unsigned

• • •

meeting. Like reports of the steel wage negotiations, Westinghouse indicates that only working issues have been discussed at negotiations and economic phases of the coming contract have not yet been covered. On the contractual issues, involving working conditions, rest periods, etc., the company believes there will be no difficulties of any great portent. However, economic issues are another matter.

As to the negotiations between Westinghouse and its independent white collared salary workers, the union that demanded a sliding scale "cost of living index" wage increase, they, too, are still in progress. This union would like a monthly adjustment of wage rates based on the U. S. Dept. of Labor's "Cost of Living Index," which currently would mean an increase of about 29¢ an hr.

Pittsburgh, long the battleground between unions and management and the scene of many

strikes, is attempting through the Chamber of Commerce to plan a new era of industrial peace. A 10-point plan, endeavoring to bring management and unions closer together as an industrial team, has been submitted to the AFL and CIO for approval. The document conceivably could become the pattern for a national solution of labor-management ills, according to some observers.

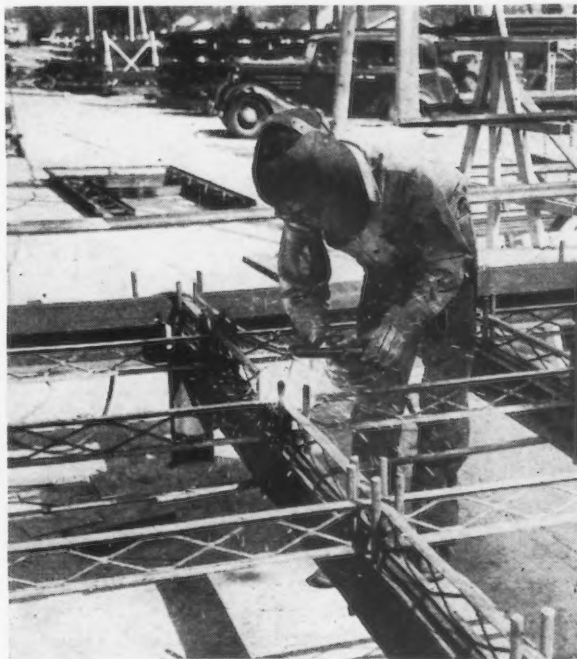
### New Erie R.R. Invention

#### Cleveland

• • • H. D. Barber, vice-president in charge of operations, Erie Railroad Co., has invented a new safety device which is being incorporated in 500 new Erie boxcars, first of which will go into operation on Erie roads some time in June.

Mr. Barber's invention, which is patented, consists of steel strips inside the boxcars with cleats flush to the walls welded into them, so that they can be used as anchors for steel strapping or loading wire, thus eliminating shifting in transit.

• • •  
IT'S A FRAME-UP: Spot welding Latisteel members in a jig at the McCarthy Tank & Steel Co., Bakersfield, Calif., to form wall panel for office building. These members, fabricated by Bethlehem Steel Co., become the building frame to which a 2-in. concrete shell is applied at the job site. R. E. McCarthy states that cost of construction is approximately midway between that for timber and reinforced concrete.



## Breaking Up the Normandie Proves to Be Big Engineering Job

Port Newark, N. J.

• • • Scrap from the former 70,000-ton French liner Normandie is moving to steel mills at the rate of 1000 to 1500 tons a week. But if it weren't for 48 daily strain gage measurements the giant hulk would probably be lying in pieces at the bottom of Newark Bay. One glance at the world's largest ship scrapping job shows it to be an engineering operation, not simply an oxygen producer's pipe dream.

The accompanying photograph helps to show what the visitor to Port Newark first notices: The Normandie is not being haphazardly cut apart plate by plate. Instead, the wrecking crew is cutting her up from the bow and from the stern according to a carefully conceived plan. According to W. Coleman, assistant superintendent of the job, her owners, Lipsett, Inc., realized that if they started at the top and began carelessly cutting straight down to the waterline the hulk would break in two amidship and

### Wreckers Study Strain Gage Results Daily to Plan Scrapping Strategy

By GEORGE F. SULLIVAN  
Asst. News Editor

either sink or become unworkable.

He explained that the hulk rose a foot for every 2000 tons removed. While the amidships sections are left virtually alone, steel is being burned from the bow and stern at such a rate that for every foot the stern rises the bow rises 3½ ft. Eventually the bow will be out of water where it can be cut off.

When this point is reached the Normandie can be handled like an ordinary shipwrecking job. She will have shrunk from over 1000 ft to about 750 ft and can be

moved from her present dock on to seven ways running into the water at a neighboring location. There, lying parallel to the shore, she can be periodically winched up the ramps on the high tides and cut up in the conventional fashion. Company spokesmen expect to get 40 to 45 thousand tons of good scrap from the vessel; with perhaps 90 pct of it steel, 8 pct iron and 2 pct nonferrous metals.

Each day, W. H. Hoffman, the engineer in charge of the job, has 48 strain gage readings made at key points throughout the vessel. Studying the log of these stresses with his superintendent, W. Hanitsch, they lay plans for the following day's burning operations. Their object, it was explained is to keep the ship rising at the predetermined rate while avoiding stresses which might break her into pieces.

Not a few shipbreaking sages wagged their heads when Lipsett, Inc., New York wrecking firm paid \$161,680 for the former pride of the French merchant marine. "Had they ever tackled a job of that size?" was the question. The answer was obvious: No, no one ever had. The Lipsetts put in a few sleepless weeks hunting for a spot to break up the ship, finally settling on a portion of the U. S. Navy Port Newark base, which the Federal Shipbuilding Co. had used for wartime shipbuilding.

Operations with a full 110-man crew got under way there on Jan. 10, 1947, and it is hoped to have the hulk down to 750-ft size, where it can be handled in a more conventional manner, by the end of July.

Meanwhile there are and will be headaches. Mr. Coleman estimated that there were 15,000 tons of debris in the Normandie. This utterly useless material ranges from bathroom tile and concrete to ballast brick and a mixture of concrete and scrap steel embedded in the bow. The ship is topheavy, a point which former passengers and naval architects agree upon. Plate thickness curiously ranges from 7/8 in. on the upper decks to about 3/16 in. on lower decks and sides.

**LOOKS EASY:** View of the stern of the former liner Normandie shows the method of cutting up the hulk in stages, retaining the amidships structure intact to provide structural stability. The French spent \$6 million to make her a super luxury liner; the Navy threw in another \$14 million trying to make something of her after she burned at her New York pier on Feb. 9, 1942.





Aside from the problems of lateral and longitudinal balance, wind has been a hazard. It once took as many as 21 lines to hold her to the dock. Firemen constantly wet down the dock to keep sparks from the burners torches under control.

Two large travelling cranes serve the dock and load directly into gondola cars. Most of the steel scrap is shipped directly to the mills in these cars without any attempt at preparation.

For preparation of nonferrous metals the operation uses shears and a cable stripping machine on the site; steel buckets fabricated from tanks cut up on a former Lipsett wrecking job are used for segregation.

Oxygen and acetylene bottles were a nuisance when the job first got under way; there were 150 to

175 bottles a day to be handled, and they cluttered up the place, Mr. Coleman declared. They therefore installed an 86,000-cu ft Linde Cascade oxygen storage system near the dock and set up an acetylene storage system. Now the burners get their gas from a header on the dock and manifolds on the ship. Oxygen consumption is 30,000 to 40,000 cu ft a day.

Safety is a fetish with the Lipsett company. Workers must wear safety shoes and helmets and burners are required to use safety gloves. The company bears 50 pct of the cost on these items. Burners also get a pint of milk in mid morning and mid afternoon, in addition to vitamin capsules. Despite the obviously risky nature of the operation there have been no serious accidents in the three months of operation.

## Five Industry Groups Start Drive to Release Government-Held Scrap

Washington

• • • Formation of a joint committee by five large industry associations to drive for the release of "millions of tons" of government-held scrap has been announced by Robert W. Wolcott, chairman of the new group.

Mr. Wolcott is head of the scrap committee of the American Iron & Steel Institute. The new group has been named the Steel, Foundry & Scrap Industries' Committee for Expediting Iron and Steel Scrap. It is composed of: The American Iron & Steel Institute; Institute of Scrap Iron & Steel; Steel Founders' Society of America; Gray Iron Founders' Society, Inc.; and the American Malleable Society. The active drive is being directed by L. D. Greene and Edwin C. Barringer from Washington headquarters at 1536 Connecticut Ave., N. W.

The following three-point program is being urged by the new group:

- (1) Declaring as scrap and selling unusable surpluses.
- (2) The return of all overseas scrap for sale at Atlantic and Pacific ports.
- (3) The acceleration of the

Maritime Commission and Navy Dept. programs for the sale of damaged and obsolete vessels for scrapping.

## Conducts Hearings On Distribution of Steel Affecting Small Users

Washington

• • • Public hearings on the problems of steel distribution and supply which are affecting smaller steel users were opened on Apr. 15 by the Steel Subcommittee of the Senate Small Business Committee, headed by Sen. Edward Martin (R., Pa.).

The committee's study is based on hundreds of complaints received from small steel consumers reporting inability to obtain adequate supplies of steel.

The sessions opened with an investigation into the difficulties experienced by erectors participating in the Army hospital construction program. Several independent erectors reported that they were unable to bid on Army contracts due to the failure of regular suppliers to deliver steel. Also appearing were officers from the Corps of Engineers and representatives of the Bethlehem Steel Co.

As the hearings progress the Committee will go into other individual problems. Of particular interest is the use of steel supplies



• • • Effective April 8, Stanley J. Smith has been appointed Chicago advertising representative of THE IRON AGE. Mr. Smith has previously been connected with the magazine *Purchasing* as Chicago manager for the past 11 years.

by fabricating subsidiaries of integrated companies, at the alleged expense of small users.

Other situations being studied involve the extent of the effects of vertical integration on small users; alleged discrimination against small users in current distribution practices; and the extent of the so-called "gray market" in steel.

The sessions have been described by Committee Counsel as an attempt to find the facts and thereby determine whether such complaints are isolated instances or a part of a broader pattern. If the latter is found to be true and legal action is feasible the Committee will make proper recommendations to the Dept. of Justice, which is conducting a private investigation of its own.

Contrary to published reports, the House Small Business Committee, while interested in steel distribution, will not conduct a formal investigation unless the Senate study bogs down. House committee staff members told THE IRON AGE that if the Senate group handles the problem satisfactorily it would be unnecessary to duplicate the work.

## Steel Firms Conserve Scrap by Using Heavier Charges of Iron Ore

New York

• • • In order to maintain steel-making operations at the highest level in spite of shortages in, and deterioration of the quality of iron and steel scrap, operating men of the steel industry have devised means of using more iron ore in the openhearth process, the American Iron & Steel Institute reported.

Normally only enough iron ore is charged into the openhearth to promote chemical reactions, and the amount of ore varies, depending on the quality and grade of steel being made. The quantity of iron recovered from such use of ore was always looked upon as incidental and unimportant.

Now additional quantities of ore are charged into the furnace in order to recover the iron content. Up to 13 pct of the weight of purchased scrap has been replaced by the iron derived from iron ore.

In using iron ore in this fashion high grade lump ore is necessary and about 1 lb of coke must be charged for every 3 lb of ore in order to promote the necessary chemical reactions. Because of the additional quantity of cold materials charged into the furnaces the time necessary to manufacture a heat of steel is increased about 4 pct. Otherwise operations are normal.

The shortages of scrap have also forced some steel companies to use larger proportions of molten pig iron at certain times in recent months. The amount of this hot

metal charged into openhearth furnaces has been as much as 70 pct of the total charge occasionally. Under normal operating conditions about half of the charge is hot metal and the balance is scrap.

Meanwhile, high operating rates of the industry's blast furnaces have made possible maintenance of a good volume of shipments of iron to nonintegrated steel producers and to foundries. In January 1947, the 90.8 pct blast furnace operating rate equivalent to 5,014,796 net tons of pig iron, was accompanied by merchant iron shipments of 671,257 net tons. The latter total was larger than shipments in any month of 1946, and the monthly average in all years since 1929, except in two war years, 1942 and 1943.

### AMERICAN IRON AND STEEL INSTITUTE SHIPMENTS OF STEEL PRODUCTS ALL GRADES INCLUDING ALLOY AND STAINLESS (Net Tons)

JANUARY - 1947

Steel Products	Number of companies	Items	Current Month		To Date This Year		Whole Year 1946	
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments
			(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	33	1	199,974	4.0	182,382		1,949,624	4.0
Structural shapes (heavy)	12	2	352,822	7.0	9,429		3,474,284	7.1
Steel piling	4	3	28,958	0.6	-		205,313	0.4
Plates (sheared and universal)	26	4	467,548	9.3	17,741		4,152,181	8.5
Skelp	5	5	13,684	0.3	39,355		227,033	0.5
Rails—Standard (over 60 lbs.)	4	6	213,300	4.2	-		1,790,311	3.7
—All other	5	7	13,403	0.3	22		144,999	0.3
Joint bars	7	8	14,573	0.2	1,359		176,803	0.4
Tie plates	8	9	43,352	0.9	815		447,496	0.9
Track spikes	8	10	14,282	0.3	-		146,194	0.3
Hot Rolled Bars—Carbon	30	11	524,669	10.4	72,383		5,006,859	10.3
—Reinforcing—New billet	15	12	93,108	1.9	730		1,048,483	2.1
—Rerolled	11	13	11,084	0.2	-		141,346	0.3
—Alloy	25	14	153,348	3.0	18,746		1,399,278	2.8
—TOTAL	41	15	788,209	15.5	91,859		7,586,965	15.5
Cold Finished Bars—Carbon	27	16	134,720	2.7	423		1,316,579	2.7
—Alloy	23	17	24,532	0.5	118		196,237	0.4
—TOTAL	33	18	159,252	3.2	541		1,512,816	3.1
Tool steel bars	19	19	8,492	0.2	367		96,020	0.2
Pipe & Tubes—Butt weld	13	20	121,290	2.4	5,118		1,276,289	2.6
—Lap weld	8	21	35,469	0.7	184		305,516	0.6
—Electric weld	11	22	64,162	1.3	1,009		674,459	1.4
—Seamless	11	23	175,722	3.5	13,608		1,871,540	3.8
—Conduit	6	24	9,783	0.2	710		98,521	0.2
—Mechanical and pressure tubing	11	25	54,411	1.1	1,521		429,180	0.9
Wire rods	20	26	59,558	1.2	20,277		679,998	1.4
Wire—Drawn	28	27	212,217	4.2	17,111		1,933,124	4.0
—Nails and staples	18	28	77,480	1.5	377		656,632	1.3
—Barbed and twisted	14	29	20,497	0.4	-		207,610	0.4
—Woven wire fence	13	30	35,591	0.7	322		383,230	0.8
—Bale ties	12	31	9,810	0.2	15		99,993	0.2
Black Plate—Ordinary	9	32	78,383	1.5	426		781,167	1.6
—Chemically treated	8	33	5,727	0.1	-		125,170	0.3
Tin and Terne Plate—Hot dipped	9	34	159,082	3.1	-		1,924,657	3.9
—Electrolytic	9	35	89,083	1.8	-		909,173	1.9
Sheets—Hot rolled	27	36	593,560	11.8	52,566		5,521,463	11.3
—Cold rolled	17	37	416,089	8.3	526		4,075,554	8.4
—Galvanized	15	38	139,794	2.8	20		1,462,053	3.0
—Electrical and enameling	10	39	49,739	1.0	199		435,170	0.9
Strip—Hot rolled	22	40	145,600	2.9	27,164		1,363,812	2.8
—Cold rolled	32	41	115,607	2.3	12,722		1,282,146	2.6
Wheels (car, rolled steel)	5	42	34,241	0.7	-		252,308	0.5
Axles	5	43	15,264	0.3	-		130,461	0.3
All other	-	44	-	-	-		6,266	-
<b>TOTAL STEEL PRODUCTS</b>	<b>139</b>	<b>45</b>	<b>5,030,008</b>	<b>100.0</b>	<b>497,745</b>		<b>48,775,532</b>	<b>100.0</b>

During 1946 the companies included above represented 99.3% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.



## AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

## YEAR 1947

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	6,544,841	95.1	384,096	87.7	283,740	65.8	7,212,677	93.0	1,628,144	4.43
* February.....	5,830,371	93.8	314,712	79.6	276,779	71.1	6,421,862	91.7	1,605,466	4.00
† March.....	6,622,839	96.2	378,781	86.5	282,896	65.6	7,284,516	94.0	1,644,360	4.43
† 1st Quarter.....	18,998,051	95.1	1,077,589	84.8	843,415	67.4	20,919,055	93.0	1,626,676	12.86
April.....										4.29
May.....										4.43
June.....										4.29
2nd Quarter.....										13.01
1st 6 Months.....										25.87
July.....										4.42
August.....										4.43
September.....										4.28
3rd Quarter.....										13.13
9 months.....										39.00
October.....										4.43
November.....										4.29
December.....										4.42
4th Quarter.....										13.14
2nd 6 months.....										26.27
Total.....										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

\* Revised  
† Preliminary figures, subject to revision.

## YEAR 1946

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053	4.43
February.....	1,300,944	20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129	4.00
March.....	5,946,698	86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859	4.43
1st Quarter.....	10,775,732	53.8	597,366	47.0	398,520	29.4	11,771,618	51.9	915,367	12.86
April.....	5,333,139	79.8	286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028	4.29
May.....	3,699,979	53.6	153,409	35.0	219,064	46.9	4,072,452	52.2	919,289	4.43
June.....	5,145,594	77.0	251,253	59.2	227,979	50.4	5,624,826	74.4	1,311,148	4.29
2nd Quarter.....	14,178,712	69.9	690,750	53.7	688,074	50.1	15,557,536	67.9	1,195,814	13.01
1st 6 months.....	24,954,444	61.9	1,288,116	50.4	1,086,594	39.8	27,329,154	59.9	1,056,403	25.87
July.....	6,023,799	87.5	365,332	83.6	228,083	48.9	6,617,214	84.9	1,497,107	4.42
August.....	6,287,617	91.1	373,837	85.4	261,755	56.0	6,923,209	88.7	1,562,801	4.43
September.....	5,947,688	89.2	371,465	87.8	235,054	52.1	6,554,207	86.9	1,531,357	4.28
3rd Quarter.....	18,259,104	89.3	1,110,634	85.6	724,892	52.3	20,094,630	86.8	1,530,436	13.13
9 months.....	43,213,548	71.1	2,398,750	62.2	1,811,486	44.0	47,423,784	69.0	1,215,994	39.00
October.....	6,308,845	91.4	387,933	88.6	253,562	54.3	6,950,340	89.0	1,568,926	4.43
November.....	5,869,767	87.8	318,350	75.1	268,655	59.4	6,456,772	85.4	1,505,075	4.29
December.....	5,283,651	76.7	222,704	51.0	253,353	54.3	5,759,708	73.9	1,303,101	4.42
4th Quarter.....	17,462,263	85.3	928,987	71.5	775,570	56.0	19,166,820	82.8	1,458,662	13.14
2nd 6 months.....	35,721,367	87.3	2,039,621	78.5	1,500,462	54.1	39,261,450	84.8	1,494,536	26.27
Total.....	60,675,811	74.7	3,327,737	64.6	2,587,056	47.0	66,590,604	72.5	1,277,150	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

## Industrywide Bargaining And Closed Shop To Be Banned in Labor Bills

Washington

• • • After weeks of hearings, labor committees in both houses of Congress have come up with tentative drafts of proposed labor bills which, as they stand, would ban the closed shop, forbid industrywide bargaining, make unions financially responsible for their actions, and provide for use of injunctions to prevent strikes against industries essential to public interest and welfare.

From an overall viewpoint, the House bill which is expected to go to the floor this week is much more stringent than the Senate measure. This is generally believed to have been intentional in order that the House would have something to bargain with when the individual bills pass and go into conference.

Both measures start at the bottom and work up by providing a bill of rights for both employers and workers, listing specific worker unfair practices whereas under the existing Wagner Act only employer

unfair practices were listed. The House measure goes further and not only gives unions the right to expel Communist members or sympathizers but forbids approval of any union as a bargaining agent if it has either a national or local officer who can so much as be "reasonably regarded" as a Communist.

Workers are protected against "unfair" union actions such as denial of secret balloting on strikes, elections or expulsions; employers are given protection against coercion, seizure of property, jurisdictional strikes and secondary boycotts, sympathy strikes and featherbedding.

Major provisions of the bills from a comparative standpoint are as follows:

**Closed Shop.** Both measures outlaw it as such but it is not forbidden when an employer voluntarily agrees to such a contract; a union may not strike to obtain such agreement.

**Industrywide Bargaining.** Under the House bill, both companies and unions are prohibited from bargaining on such basis under threat of invoking the antitrust laws; Senate version discourages it by re-

quiring the NLRB to certify only unions made up of employees of one employer but does not specifically forbid cooperation with the International.

**Secondary Boycotts and Jurisdictional Strikes.** Refusal to handle goods made by other than an employer or strikes caused by disputes over which union shall do a certain type of work are strictly forbidden by both bills. Strikers could be punished by antitrust prosecution, loss of bargaining rights for one year, and institution of damage suits.

**Strikes Affecting Public Health and Safety.** The government would be allowed to obtain injunctions under both measures. The House would limit such injunctions to 75 days' duration; the Senate would limit them to 60 days for mediation and 15 days for a strike vote.

Other provisions include a requirement that each party must bargain in good faith, guarantee of free speech by an employer, forbid employer contributions to a union, and prohibit political contributions by unions.

Both bills would permit unions to be sued for damages for the violation of contracts.

### Coming Events

- Apr. 21-23 American Institute of Mining & Metallurgical Engineers, openhearth, coke oven, blast furnace and raw material committees, annual conference, Cincinnati.
- Apr. 28-29 American Zinc Institute, annual meeting, St. Louis.
- Apr. 28-May 1 American Foundrymen's Assn., convention, Detroit.
- Apr. 29-May 1 Industrial Packaging and Materials Handling Exposition, Industrial Packaging Engineers Assn. of America, Chicago.
- May 5-6 National Welding Supply Assn., convention, Philadelphia.
- May 6-10 Society of the Plastics Industry, Inc., exposition, Chicago.
- May 12-15 American Steel Warehouse Assn., annual meeting, Los Angeles.
- May 15-17 Society for Experimental Stress Analysis, annual meeting, Chicago.
- May 21-22 American Iron & Steel Institute, annual meeting, New York.
- May 26-27 Assn. of Iron & Steel Engineers, annual spring conference, Philadelphia.
- May 27 Metal Powder Assn., spring meeting, New York.
- June 2-4 American Gear Manufacturers, Hot Springs, Va.
- June 5-7 Electric Metal Makers Guild, Inc., annual meeting, Pittsburgh.
- June 9-11 American Coke & Chemical Institute, annual meeting, French Lick, Ind.
- June 15-19 American Society of Mechanical Engineers, semiannual meeting, Chicago.
- June 16-20 American Society for Testing Materials, annual meeting, Atlantic City, N. J.
- June 17-19 Machinery Dealers National Assn., convention, Cincinnati.
- June 23-27 American Electroplaters Society, industrial finishing show, Detroit.
- July 14-18 American Society of Civil Engineers, Duluth, Minn.
- Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
- Sept. 8-12 Instrument Society of America, conference, Chicago.
- Sept. 10-12 Porcelain Enamel Institute, Inc., Columbus, Ohio.
- Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Cleveland.

### Membership in AFA Reaches All-Time High

Chicago

• • • Membership in American Foundrymen's Assn. on Apr. 1 was at a new all-time high of 9364, according to W. W. Maloney, secretary-treasurer. The new peak represents a gain of 1291 members, or approximately 16 pct, over the total a year earlier and an increase of 27 pct over Apr. 1, 1945.

The Apr. 1, 1946-47, increase was the largest for a 12-month period in the association's history, Mr. Maloney pointed out, adding that AFA membership now extends to every foundry area of North America and to many foundry centers abroad.

On Mar. 1 more than 7500 of AFA members in the United States had chapter affiliation, and membership in the association's Canadian and Mexican chapters totaled 725. On that date the membership roll showed 392 members outside the North American continent.



## Weekly Gallup Polls . . .

### Limiting Right of Public Service Workers to Strike Favored

Princeton, N. J.

••• If organized labor has strong arguments to justify strikes in public utilities such as telephone, gas or electric power companies, those arguments do not seem to have registered effectively on the public mind, according to George Gallup, director, American Institute of Public Opinion.

While the general public is (1) not anti-union, (2) believes strongly in the right of collective bargaining, and (3) has sympathy with many union wage demands, nevertheless, the majority of voters have reservations in their minds about the right of workers to shut down public service industries by striking.

The public divides into two main camps on the issue. The attitude of one camp is typified by this comment from a Pittsburgh white collar worker interviewed by the Gallup Poll:

"When your phone is shut off, or you have no electricity or gas, there's no substitute that you can get. Any union that can shut down a public utility has too much power. Somebody's got to protect the public."

The other camp holds that organized labor has a right to protect its interests in any type of industry. This attitude is summarized by the following from a Chicago voter:

"Why should a man be penalized just because he works for a local utility? He has the same problem of making ends meet as anyone else. In the phone companies I don't see the dividends being regulated. Then why should the employees' rights be regulated?"

The numerical size of the two groups in the population holding these contrasting opinions is shown in the following coast-to-coast poll:

"Should laws be passed to forbid all strikes in public service industries such as electric, gas, telephone and local transportation companies?"

The vote for the nation is as follows:

	Pct
Yes .....	58
No .....	30
No opinion .....	12

The public's unfavorable attitude toward utility strikes was not brought about solely by the publicity given at the time to threats of a phone strike. For at least a year the general opinion has been virtually the same.

In April 1946, an institute poll on the identical question found 60 pct in favor of outlawing utility strikes, 32 pct against and 8 pct without opinion.

Farmers and business and professional people are the most in favor of strike limitation in public service industries. Among manual workers and white collar workers there is also a majority vote for the limitation.

	Yes Pct	No Pct	No Opin. Pct
Farmers .....	67	22	11
Prof. & Bus. ....	61	32	7
White Collar .....	59	32	9
Manual Workers ...	52	33	15

A related issue is the right of government employees to go on strike. The New York State Legislature recently passed a law providing severe penalties for public employees engaging in strikes.

The principle of such limitation is widely approved by the American public.

A coast-to-coast poll was conducted by the institute on the issue:

"Should the people who work for the government be allowed to go on strike?"

The vote:

	Pct
Yes .....	22
No .....	69
No opinion .....	9

The reasoning of the majority on this question is that if strikes against government are permitted, a situation resembling anarchy may one day arise. Even so ardent a champion of organized labor as the late President Roosevelt frowned upon the use of the strike weapon by government employees.

### Voters Prefer Democratic Party To GOP During Hard Times; Filibusters Should Be Restricted

o o o

••• One thing the Democrats have succeeded in selling the American voting public during the past 15 years is that the Democratic Party is the party of the working man.

It is the belief which persists today. The feeling is widespread that the Democratic Party has the welfare of the working man more at heart than the Republican Party. That feeling accounted in large part for Mr. Roosevelt's series of successes at the polls and the same feeling may be of inestimable aid to Mr. Truman in the 1948 political campaign. The results of two polls just completed across the nation show:

(1) A majority of voters would rather have the Democrats than the Republicans in office during hard times.

(2) A majority of voters believe the Democratic Party is better able than the Republican Party to keep wages high.

The level of prosperity will thus be of considerable importance when the 1948 elections roll around.

In making the present surveys of the nation's voters, the institute had field reporters ask:

"If hard times come again, would you rather have the Republicans or Democrats in office?"

The replies:

	Pct
Would like to see Republicans in .....	30
Would like to see Democrats in .....	51
Makes no difference .....	19

Eight in every 100 questioned throughout the country offered no opinion.

The belief that the Democrats have the wage earners' interests more at heart than the Republican Party is shown by replies to the second question in the poll:

"As you feel today, which political party (CONTINUED ON PAGE 155)

## WAA Turns to Multiple Tenancy Program to Sell Surplus Plants

### Washington

• • • Faced with the fact that the more desirable surplus war plants have been auctioned off and that from now on real property remaining as backwash of the war will be a drug on the market, War Assets Administration's Real Property Board is focusing more and more attention on a program it started about a year ago as an experiment.

This is the multiple tenancy project by which war plants which are too large or too specialized to attract buyers are subdivided with portions of suitable sizes sold or leased to small operators.

At the present time, WAA is operating six such plants as multiple tenancy projects while the Coosa River Ordnance plant in Alabama has been purchased by local interests for operation under a similar plan. An eighth, the former Wright Aeronautical Corp. plant at Fairlawn, N. J., has been sold to a group of six different industries.

WAA's six projects are the Bechtel-McCone plant, Birmingham; the Alcoa forging plant at

### Project Would Subdivide Large Or Specialized War Plants To Attract Buyers

• • •

Canonsburg, Pa.; the Consolidated-Vultee plant at San Diego; the Basic Magnesium property at Henderson, Nev.; the Pratt & Whitney plant at Kansas City, Mo.; and the Illinois Ordnance plant at Carbondale, Ill.

In the instance of the Bechtel-McCone property, some 19,000 jobs were wiped out with the cancellation of war contracts and WAA was left with what would ordinarily be a white elephant—250 acres of land on which were 18 buildings with a total of 1.3 million sq ft of floor space and 35 acres of concrete runways and flight strips.

However, with the assistance of Birmingham officials in rounding up prospective tenants, some 20 firms have leased nearly 500,000 sq ft of the available floor space. Some are manufacturing items ranging from toys to automobiles. Others are providing professional

and auto and aircraft repair services. Negotiations are reported under way for leasing most of the remaining space.

At the Alcoa plant at Canonsburg, five concerns—Continental Can Co., Radio Corp. of America, National Can Co., Pennsylvania Transformer Co., and National Metals Products Co.—each have leased most of the 840,000 sq ft of space exclusive of the 210,000 sq ft reserved by the Army as standby storage space.

Of the 1.8 million sq ft of space at the San Diego Consolidated-Vultee plant, WAA has reserved some 400,000 sq ft for closed storage purposes; of the remainder, 83,000 sq ft have been leased to small concerns. In anticipation of future plant operations, the Veterans Cooperative Service Stores, Inc., has bought the cafeteria building while a total of 31 acres has been sold to the San Diego county for development of a civic center, the San Diego Baseball Club (the parking lot) for a baseball park, and the Western Service & Equipment Co. property (salvage yard and buildings) for a trucking terminal and service station.

Typical of the difficult problems encountered is the Basic Magnesium property. This included 30,000 acres—including a government created town which grew to be the third largest in the state—covering an entire industry. However, to date, four chemical companies have leased portions while the Ruth Mitchell True Gems Co., has leased property where disabled veterans are to be employed in the designing and manufacture of jewelry items.

The Pratt & Whitney plant could not be sold since it is one of those designated by the Navy for stand-by status. However, WAA has leased a great deal of the more than 2.5 million sq ft of floor space in six major buildings under the multiple tenancy plan with the agency furnishing management and landlord services.

Also difficult to handle because of its scattered areas which are suitable to industrial purposes has

**BIG BLOW COMING:** German workers rolling a loaded torpedo warhead into place before an entrance to one of the 150-ft deep tunnels on the German island of Helgoland. British demolition experts plan to set off 7000 tons of high explosives in a single shot to blow the military installation to smithereens.





been the Illinois Ordnance plant. While some portions of the property have been leased, it is generally expected that at least half of the 22,000 acre property will wind up in the possession of the Fish and Wild Life Service since definite moves have been made by the Service to obtain such an assignment.

A number of the plants remaining for disposal were built to meet special or specific purposes and the characteristics which fitted them for war production make them unfit for civilian pro-

duction. In some cases, they are spread over considerable areas, as in the instances of the Basic Magnesium and the Illinois Ordnance properties, and for safety purposes the loading lines were miles apart with warehouses and storage plants widely scattered.

The WAA, in light of a limited success in this line, is studying the possibility that multiple tenancy may have to be the answer to disposal in a number of cases. A study of the feasibility of such disposition has been made in the instance of the Wright Aeronau-

tical Corp. plant at Lockland, Ohio, where there is 5.6 million sq ft of usable space.

Other plants under consideration for similar disposal include the Sangamon Ordnance plant, Illiopolis, Ill., 3.9 million sq ft; Boeing Aircraft plant, Wichita, Kan., 2.9 million; Dow Magnesium plant, Marysville, Mich., 2.8 million; Des Moines Ordnance plant, Des Moines, 2.1 million; Boeing Aircraft plant, Renton, Wash., 1.7 million; and the Green River Ordnance plant, Dixon, Ill., 1.3 million sq ft of space.

## CPA Approved 91,140 Construction Projects; Disapproved 59,593

Washington

• • • During the first 52 weeks of the emergency housing program, the CPA approved 91,140 commercial and industrial building projects having a total estimated construction cost of \$3 billion, it is reported by the Office of Temporary Controls.

Over the same period, OTC said, the CPA disapproved 59,593 applications for projects which would have cost an estimated \$2.2 billion in nonresidential construction.

A breakdown of the types of nonhousing construction authorized during the first half of the year—March 26 through September—showed that \$1.7 billion was marked for new construction, \$176 million for conversion and alteration, and \$40 million for maintenance and repair.

Industrial building led all other types in authorized construction during the first 6 months with \$843 million approved for such use. Other authorizations by type and use were as follows:

Commercial, \$464 million; public utility, \$205 million; educational buildings, \$218 million; hospitals, \$93 million; religious, \$43 million; institutional, \$27 million; and, miscellaneous, \$52 million.

The New York area led all others in both construction approved and denied. A total of 14,490 applications for \$413 million worth of construction was approved and 7471 for \$315 mil-

lion were denied (neither figure includes projects reviewed by the Review Committee).

Least construction activity was recorded for the Minneapolis region where \$62 million was approved and \$35 million denied.

## Sells Strategic Material

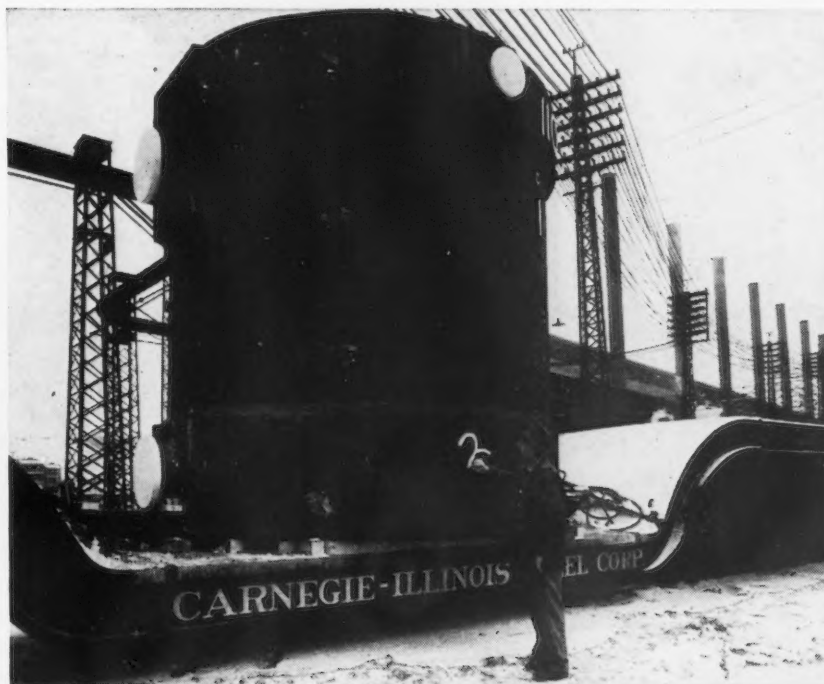
Washington

• • • About \$33 million worth (estimated cost) of strategic materials, such as copper, lead, tin and zinc, have been channeled into industry by WAA during the past year.

In a report on some 40 kinds of material for the period Mar. 26, 1946, to Mar. 7, 1947, WAA said that a cumulative total of more than \$26,163,000 worth of strategic materials was sold through WAA offices and more than \$6,407,000 worth turned over to the RFC to be allotted by CPA to meet civilian deficiencies.

An estimated 188,369,749 lb of copper which cost about \$19,443,238 was returned to civilian use through WAA offices and 13,500,093 lb costing \$1,622,548 was turned over to RFC for release to CPA.

**BIG JOB FOR TINY ATOM:** This 180-ton silica iron mold en route to Carnegie-Illinois' Homestead works was used to pour a 250-ton forging ingot for use on a 200 million-v cyclotron magnet.



## Expect Additional Price Reductions in Alloy Steel Products

### Pittsburgh

• • • The elimination of the 8.2 pct charge on the base and extras for hot-rolled alloy strip by Carnegie-Illinois Steel Corp. on Apr. 10 marks the first time that Carnegie-Illinois has ever had an extra card on this product. It brings the company's pricing system on the product into line with the system adopted by Sharon Steel Corp. last January and Bethlehem Steel Corp. some weeks ago. Doing away with the 8.2 pct pricing eliminates an unusual and unwieldy pricing procedure but does not necessarily reflect a softening in the market on alloy steels. However, the alloy market, especially on flat-rolled items, has been relatively easy for some time.

Currently, alloy plates and sheets still use the schedule of base price and extras to which are added 8.2 pct, instituted in 1946 when OPA permitted an 8.2 pct price increase on stainless and alloys.

The price of plates as quoted

### See Alloy Sheet Price Cut To Follow Alloy Strip Drop; Plate Price Firm

By T. E. LLOYD  
Pittsburgh Regional Editor

by most alloy producers is 3.50¢ a lb, to which is added 0.29¢ a lb to arrive at the base price of 3.79¢ a lb quoted in THE IRON AGE. The price of one standard grade of alloy sheets is 13¢ a lb, to which is added 1¢ a lb (8.2 pct), arriving at a total base price of 14¢ a lb. This pricing practice will be eliminated as quickly as possible, it is believed, making the base a flat price and the extra charges without additions.

Backlogs of orders for alloy steels are generally running about 60 to 75 days, but small bar sizes, the tightest specific product, are

being quoted for six months' delivery. February was an extremely heavy month from the standpoint of new orders, and one firm reported that last week it had the two biggest days in history for alloy bookings.

Alloy sheet demand slipped during the war and is at present about the same as it was prior to the war. The alloy plate market is soft, but observers state that this is not unusual since the demand for alloy plates is fairly limited. Small bar output is being limited by the available rolling capacity, since it must compete for mill space with carbon bars which are likewise in heavy demand.

The 60 to 75 day lead time on alloy orders is probably better than on most other steel products. Actually, such delivery schedules are nearly the minimum that a mill can promise under any but very subnormal marketing conditions.

Should general steel demand fall off to any degree, it is likely that the alloy market will soften and perhaps result in price cutting. There are some alloy users, despite mills guarding against the practice, who could and would prefer to use carbon steels. However, the fact that alloy steels are more readily available is worth the premium price to them. Should carbon steels become available, these consumers may shift. While this should have no major effect on the alloy market, it is a factor in a falling market.

The recent price cut of 8.2 pct on the base price of alloy strip will likely be duplicated on sheet, but alloy plate consumers may find that a new base of 3.79¢ a lb is established, which, of course, is the present 3.50¢ base plus the 8.2 pct. The differential between alloy sheet and plate prices has long been a subject of discussion and the trade has been waiting for weeks for some price adjustment on these items. The differential is too far out of line, some consumers feel, and there is even a possibility that steps will be taken beyond juggling the 8.2 pct to close the gap between these prices.

**BABY SITTER WITH A BADGE:** A series of "open house" nights during which American Rolling Mill Co. employees at Middletown, Ohio, toured the plant and had refreshments with company officials produced this unusual picture. This Armco gate watchman, couldn't permit children under ten to enter the plant so he took a baby sitter's job so this tot's folks could tour the shops.





# The London **ECONOMIST**

## Anti-Trust Activity

**W**HEN the United States entered the recent war, its anti-trust laws were being enforced upon a scale, to judge by the number of presentations, four times larger than ever before in their history. During the war, in spite of a series of dramatic prosecutions of international cartels, enforced competition gave way temporarily to control of the economy by various war agencies. Today, as the last of the wartime controls are being liquidated, the primacy of the competitive policy is being restored.

The end of the war found control of American industry more highly concentrated than ever before. The 250 largest manufacturing corporations, which owned 65 pct of the nation's productive facilities in 1939, operated 79 pct of the new war facilities built with federal funds and in September 1944 held 75 pct of the prime war supply contracts.

An effort is being made to sell about \$11½ billion worth of government-owned war plants in such a way as to reduce industrial concentration. The Surplus Property Act provides that such sales shall be designed to strengthen free and independent enterprise and discourage monopolies. When a plant worth more than \$5 million is sold, the Attorney General reviews the sale and reports whether it is consistent with this purpose.

In the aluminum industry, leases of government plants to Reynolds Metals Co. and Permanente Metals Corp. have gone some way towards loosening the control formerly enjoyed by the Aluminum Co. of America. In 1944 this company controlled productive capacity for alumina, primary aluminum, and sheet, strip, and plate which ranged from 86 to 96 pct of the total American capacity. At the end of 1946 it controlled from 44 to 54 pct of the nation's capacity for the same products.

A similar diffusion of control has been accomplished in the sale of government-owned nitrogen plants. However, these cases are exceptional. Nearly 70 pct of all sales and leases of government-owned war plants prior to 1947 were made to about 60 concerns, which are among the largest 250 manufacturing enterprises in the country. A striking example is the steel plant at Geneva, Utah, largest in the Far West, which was sold, with the approval of the Attorney General, to a subsidiary of the country's largest steel producer, the U. S. Steel Corp.

**T**HE growth of economic concentration has aroused some political protest. Last year a Senate committee made public a report by the Smaller War Plants Corp. which said that the war had enhanced industrial concentration and predicted that concentration would remain higher in the post-war years.

Just before the Democrats lost their committee chairmanships, the Senate Small Business Committee published a report on the future of independent business which treated the concentration of economic power as the principal problem of the day and offered a variety of remedial recommendations, including the establishment of a new Dept. of Small Business, increased appropriations to enforce the antitrust laws, new laws against mergers of competing corporations and against use of basing point systems of pricing, reorganization of the patent system, registration of trade associations, and requirement that corporations engaged in interstate commerce operate under federal rather than state charters.

Use of the antitrust laws to dissolve large corporations is also beginning. A federal court has declared that the country's largest grocery chain is an illegal combination in restraint of trade, and the Supreme Court has sustained

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• • •

an antitrust decision which requires divorcement of the manufacture of sleeping cars from their operation by the Pullman Co., which formerly monopolized both kinds of business. These cases were initiated several years ago, but they are now regarded as merely the first skirmishes of a campaign by the Dept. of Justice to break up some of the larger and more powerful enterprises. The Federal Trade Commission has renewed its long standing recommendation that the law be amended to make mergers difficult.

**T**HE attack upon bigness is the most recent development in a broad revival of antitrust prosecutions. More than 29 cases, many of which involve international cartel activity, were postponed to allow the defendants to concentrate upon war work. These are now on their way through the courts.

A test case to determine whether the use of basing point formulas is illegal price-fixing is being carried to the Supreme Court by the Federal Trade Commission, which failed to establish this doctrine in a lower court. However, prosecutions of new price-fixing agreements are still relatively few, since there is little incentive to make such arrangements while goods are scarce and prices are rising.

Control of Congress by the Republican Party is not likely to diminish the importance of the antitrust laws. True, this party contains a group which is tender of the interests of big business,

(CONTINUED ON PAGE 157)

## Industrial Briefs . . .

• **CORRECTION**—In the Jan. 23 issue of *THE IRON AGE* in this column it was erroneously announced that George N. Sieger had been elected president of the American Welding Society. Mr. Sieger was elected second vice-president. He has also been elected to the presidency of the Resistance Welder Manufacturers Assn.

• **NEW ADDITION**—Construction of a \$385,000 addition to the duplate department at Pittsburgh Plate Glass Co.'s Creighton, Pa., plant will be started early in April according to an announcement of the firm.

• **BRITISH AGENTS** — A. C. Wickman, Ltd., Coventry, England, have been appointed sole agents in the United Kingdom, British Empire and Europe (excluding Russia) for "Hufford" hydraulic stretch-forming machines, designed and manufactured by Hufford Machine Works, Inc., California.

• **PITTSBURGH OFFICE** — A new sales office of Rollway Bearing Co., Inc., Syracuse, N. Y. has been opened in Pittsburgh, with John B. Bell in charge. Address of the new office is Room 507, Renshaw Bldg., Pittsburgh.

• **HEADS GM INSTITUTE**—S. E. Skinner, vice-president of General Motors and general manager of the Oldsmobile Div., Lansing, Mich., was elected by the board of regents of General Motors Institute, Flint, as president of the institute and chairman of the board.

• **COR-TEN LICENSE**—Carnegie-Illinois Steel Corp. announced that Sharon Steel Corp. has been licensed to manufacture "Cor-Ten," corrosion-resisting, high-strength, low-alloy steel, developed by Carnegie-Illinois.

• **NEW FIRM**—Maguire Machinery Co., Inc., New York, has been organized to engage in the designing, manufacturing and selling of dairy machinery and power conveyors. Walter Maguire is president.

• **NEW STEEL MILL**—The formation of a new steel mill, The Precision Drawn Steel Co., Inc., Camden, N. J., for the purpose of cold finishing steel bars including full range of sizes together with special shapes. The plant will have an annual production capacity of 50,000 tons.

• **GRANTS SELLING RIGHTS**—The Taylor-Hall Welding Corp., subsidiary of The Federal Machine & Welder Co. of Warren, Ohio, announces that it has entered into an agreement with the Do-All Co. of Des Plaines, Ill., which gives the Do-All Co. the exclusive right to sell Taylor-Hall welding products in the export market.

• **SMOKELESS HEATER**—Manufacturing plans for the new smokeless coal heater of the Moore Div. of the Conlon-Moore Corp., are being vigorously pushed to completion. Progressive straight-line production is scheduled for May and manufacturing volume will be stepped up as raw material procurement permits. The new heater burns all grades of coal smokelessly. The operating cost is said to be one half that of old style coal heaters.

• **LINDBERG MERGES**—Lindberg Engineering Co., Chicago, manufacturer of heat treating furnaces and electrical equipment, and Fisher Furnace Co., Chicago, manufacturer of nonferrous melting furnaces, refractories, and blowers have recently united their organizations.

• **CUTS STEEL PRICES**—Pennsylvania Flexible Metallic Tubing Co., located at 7200 Powers Lane, Philadelphia, announced a cut in prices of flexible metallic steel tubing effective immediately.

• **TO SPLIT STOCK**—Stockholders of Cleveland Graphite Bronze Co. at the annual meeting Apr. 7 approved a proposal to split common stock two for one.

## Supreme Court Rules On State Labor Disputes

Washington

• • • In a 6-3 decision the U. S. Supreme Court has ruled that states cannot regulate labor disputes which are covered by federal laws and are therefore under the jurisdiction of the National Labor Relations Board, even though the latter fails to accept jurisdiction.

More specifically, the majority decision delivered by Justice Jackson held that the New York State Labor Relations Board cannot certify foremen's or supervisory unions for collective bargaining purposes though the NLRB declined "jurisdiction in certain types of cases, for budgetary or other reasons."

The dissenting opinion was delivered by Justice Frankfurter in which Justices Murphy and Rutledge joined. Both opinions noted that the effect of the decision might work to delay determination of some labor cases.

In effect, this is taken to mean that should the Congress seriously slash operating funds of the NLRB the state boards could not take over and handle cases for which the national group had neither personnel nor funds.

The opinion was rendered in answer to an appeal by Bethlehem Steel Co. and the Allegheny-Ludlum Steel Corp. from a ruling by the New York State Labor Relations Board.

## New AISI Vice-President

New York

• • • At a meeting in New York the board of directors of the American Iron & Steel Institute elected H. E. Lewis, former chairman and president of Jones & Laughlin Steel Corp. and director of American Iron & Steel Institute to be an honorary vice-president of the institute.

Ben Moreell, new chairman and president of Jones & Laughlin Steel Corp., was elected a director, replacing Mr. Lewis.

Carl W. Meyers, president of Colorado Fuel & Iron Corp., was elected to fill an existing vacancy on the board.



## Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 9006 Tons, Tulsa, Okla., 40-mile 20 in. pipeline for Colorado Interstate Gas Co. has been abandoned.
- 8000 Tons, Peoria, Ill., factory building, Caterpillar Tractor Co. to Carnegie-Illinois Steel Corp., Pittsburgh.
- 2480 Tons, Steubenville, Ohio, blast furnace trestle for Wheeling Steel Corp. to Carnegie-Illinois Steel Corp., Pittsburgh.
- 2450 Tons, Toronto, Ohio, power plant extension for Ohio Edison Power Co. to Carnegie-Illinois Steel Corp., Pittsburgh.
- 2000 Tons, Passaic River, N. J., New Jersey Dept. of Highways, bascule bridge, Mt. Vernon Bridge Co., Mt. Vernon, Ohio, low bidder.
- 1250 Tons, Los Angeles, new Helms Bakeries plant, to Consolidated Steel Corp., Los Angeles.
- 1150 Tons, Chicago, oil storage tank, Western Oil & Fuel Co. to Bethlehem Steel Co., Bethlehem, Pa.
- 720 Tons, Chicago, Little Calumet River bridge to Bethlehem Steel Co., Bethlehem, Pa.
- 320 Tons, Los Angeles, National Lead factory and warehouse, to Consolidated Steel Corp., Los Angeles.
- 300 Tons, Long Beach, Calif., transit shed, to Pacific Iron & Steel Co., Los Angeles.
- 220 Tons, Calumet City, Ill., 59th St. grade separation to Bethlehem Steel Co., Bethlehem, Pa.
- 200 Tons, Fort Collins, Col., 72-in. pipeline Spec. 1710, Thompson Pipe & Steel Co., Denver.
- 200 Tons, Berwick, Pa., Berwick Weaving Co., manufacturing building, to Bethlehem Steel Co., Bethlehem, Pa.
- 150 Tons, Richland, Iowa, Keokuk County highway bridge S930-2 to Pittsburgh-Des Moines Steel Co.
- 135 Tons, Delta, Iowa, Keokuk County highway bridge to Pittsburgh-Des Moines Steel Co.

• • • Fabricated steel inquiries this week included the following:

- 700 Tons, Omaha, Neb., field house.
- 600 Tons, Sylvania, Wash., bridge No. 17.
- 500 Tons, El Segundo, Calif., Standard of California warehouse.
- 480 Tons, Portland, Ore, steel towers and other structurals, McNary-Pasco transmission line, Bonneville Power Administration Inv. 3940, bids under advisement.
- 470 Tons, Sandstone, Minn., state highway bridge.
- 450 Tons, Evanston, Ill., mill building for Korhumel, Heffron and Preiss Steel Co.
- 450 Tons, Minnesota, bridge 5718, Kettle River.
- 400 Tons, El Centro, Calif., imperial irrigation district.
- 375 Tons, Millville, N. J., New Jersey Dept. of Highways, vertical lift bridge over Maurice River, May 1.
- 265 Tons, Dubois, Pa., Pennsylvania Dept. of Highways, plate girder bridge, May 25.
- 250 Tons, Buffalo, Allied Chemical & Dye Corp., roof, May 17.
- 150 Tons, La Grange, Ill., warehouse extension, Electro-Motive Div., General Motors Corp., Detroit.
- 100 Tons, Red Ring, Minn., Pittsburgh Plate Glass Co. building.
- 100 Tons, South Chicago, boiler house extension, Freyn Engineering Co., contractor.

• • • Reinforcing bar inquiries this week included the following:

- 305 Tons, Pleasant Grove, Utah, Bureau of Reclamation, Denver, Inv. 27,990-B-5, bars for Provo River Project, bids to Apr. 21.
- 215 Tons, Bend, Ore., Willow Creek siphon

and wasteway, Bureau of Reclamation, Bend, Ore., Spec. 1719, bids under advisement.

- 135 Tons, Stanislaus County, Calif., bridge across Tuolumne River, near Modesto, California Div. of Highways, Sacramento, bids to May 7.

• • • Sheet piling awards this week included the following:

- 18,505 Tons, Long Beach, Calif., piling sections for harbor improvements, Carnegie-Illinois Steel Corp., Pittsburgh.

• • • Pipe awards this week included the following:

- 5400 Tons, Napa, Calif., pipe and appurtenances for pipe line project, through Basalt Rock Co., Inc., to Columbia Steel Co., San Francisco.
- 1100 Tons, Buffalo, water pipe, including connections and special castings, Dept. of Public Works, to Florence Pipe Foundry & Machine Co., Philadelphia.

Correction on last week's report of the 500 reefers to be built by the Fruit Growers Express Co. The 500 cars are part of the 1135 car program started by this company last year and the award of an additional 500 cars by Fruit Growers Express to American Car & Foundry was in error.

### Portsmouth Steel Plans \$1 Million Expansion In Fine Wire Equipment

Portsmouth, Ohio

• • • A \$1 million major expansion program to make fine wire and wire specialties has been announced by Elmer A. Schwartz, president, Portsmouth Steel Corp.

New high speed wire equipment and other plant improvements, including another fence machine and a new galvanizing line, will be installed which will increase production in the rod and wire mill department from 13,000 to 22,000 tons a month.

Portsmouth's present wire department equipment includes 203 wire drawing blocks (155 single, 40 continuous), drawing wire from from ½ to 19 gage; 155 wire nail machines; three wire staple machines; 26 barbed wire machines; 12 wire fence machines; seven bale tie machines and two galvanizing units. Chief products now made in the mill are barbed and fence wire, road mesh and nails.

In January, Portsmouth announced proposed production of oil tempered spring wire for use in automobile and mechanical equipment and industrial cloth, etc.

Uno V. Johnson, formerly wire

mill superintendent of Wickwire Spencer Steel Co., has been named superintendent of Portsmouth rod and wire mills department. John E. Nordstrum and James N. Van Cleave have been named chief metallurgist and assistant superintendent of production, respectively, of the rod and wire mill department.

### Coke & Chemical Firm Elects New Officials

Pittsburgh

• • • Pittsburgh Coke & Chemical Co. announces that the board of directors of the company has elected J. H. Hillman, Jr., as chairman of the board. Mr. Hillman had previously been president. Richard M. Marshall has been elected president. Mr. Marshall came to the company in 1941. He was formerly vice-president and general manager of Woodward Iron Co. and vice-president of Sloss Sheffield Steel & Iron Co., both of Birmingham. Until his election to the presidency of Pittsburgh Coke & Chemical Co., he had been executive vice-president.

G. E. Dignan, former works manager at the company's Neville Island plant, has been elected vice-president of operations. He joined the company in 1929 when it was known as Davison Coke & Iron Co.

W. S. Scott has been made vice-president, sales. He was formerly general manager of sales, having joined the company in 1928. Formerly he was in charge of pig iron sales with E. W. Mudge Co.

The following were re-elected by the board of directors: T. W. Kirkpatrick, secretary; H. R. Mustard, treasurer and controller; and J. E. Hirleman, assistant treasurer and assistant controller.

### March Building Up 30 Pct

Washington

• • • New construction put in place during March totaled \$785 million, representing a 30 pct increase over March, 1946, according to the Dept. of Commerce. About \$616 million of the total was privately financed.

# MACHINE TOOLS

... News and Market Activities

## Joint Army-Navy Machine Tool Tagging Teams Get Up Steam

••• Joint Army-Navy teams tagging machine tools for the Joint Army-Navy Machine and Tool program from War Assets Administration inventories held the spotlight in major machine tool markets. The trend in new firm orders continued at the spotty level of recent weeks.

With 80,000 machine tools as an avowed goal, the JANMAT program apparently has some distance to go before completion. A recent report indicated that some 8000 units had been tagged and shipping instruction supplied for 600. This program, which has been badly bogged down in red tape and resultant indecision, has picked up speed in the last few days. About 1400 tools have been tagged in the Dodge Chicago plant, future home of the Machine Tool Show, and the Tucker Torpedo, and about 2200 tools have been tagged in WAA warehouses in the Cleveland area.

The teams have not shown thus far any particular partiality as to type or make, but have tagged anything and everything of any possible value to JANMAT in the future. Proponents of the JANMAT program, led by the military and the machine tool industry, have been of a mind to boost the ultimate goal to 200,000 machine tools, which some observers believe would pretty well solve the industry's surplus machine tool problems.

At the same time, removal of the tools from the Clayton formula is still in the suggestion stage. It has been proposed numerous times that machine tools from surplus should be sold where is, as is, with the paperwork being handled after the sale. Qualified observers believe that this move will be made sooner or later, but no actual, effective date has yet been rumored.

Reports that WAA is about to open an office in Mexico City for

### All Types and Makes Tagged; Program Has Established Goal of 80,000

o o o

sale of surplus of all kinds, including machine tools, has already drawn complaints from some segments of the industry, which have spent considerable money, time and effort in setting up export outlets of their own. Such company outlets, it is alleged, would be wrecked by WAA's move down Mexico way, and undoubtedly more on this score will be heard later.

Recent confirmation that the volume of surplus machine tools is only half as great as originally estimated has led some observers to believe that the next few months will see the end of the surplus, one way or another.

President Truman's plea for a roll-back in prices fell on deaf ears in most segments of the machine tool industry, however, since the curve of prices in many segments of the industry is rising, and only new models will reduce the price on the old. At present volume, many machine tool builders are in a position where price increases rather than decreases must be considered.

Some strength in the capital goods industry is showing itself in new firm orders for standard, general purpose machine tools. A few segments, particularly builders of lathes, are receiving orders beyond their wildest expectations of a few weeks ago; others are not so fortunate.

If there should be a steel strike, some observers point out, the undercurrent in capital goods would undoubtedly be stopped. By and large, the machine tool industry is hungry for a sustained flow of new firm orders, but it is not likely this hunger will be sated any-

way but piecemeal until fall, according to informed sources in the trade.

In Boston and the East it is difficult to find a machine tool plant not employing more workers than it did before the last World War. There are some on two shifts with intention of adding a third, but not until the steel and pig iron situations are righted. Such concerns have ceased to be straight machine tool companies. Demand for textile machinery is exceptionally heavy, makers being booked well into if not through 1949.

Machine tool makers are turning out a lot of textile machinery parts. Automotive equipment or service machinery, machinery adaptable for the fishing industry, cutting tools, plastic protrusion equipment, are but a few lines machine toolers have taken on. It is noticeable, however, that the rank and file are not taking on additional help, although Worcester concerns still advertise freely for help and say the supply of skilled labor is limited.

In Cincinnati the market remains without interesting new feature. One manufacturer reports that foreign business remains slightly in advance of domestic business, which is reported slowing down. One large source in this area reports that any comprehensive picture is impossible because of the erratic condition of ordering. Most plants are still doing a large amount of contracting work in order to keep men and machines occupied. In fact, some interests indicate that contracting work is keeping some departments in operation and without it these departments would have to be closed.

There has been some discussion voiced in Cincinnati of price roll-backs in accordance with the President's appeal to business and industry, but so far as machine tool markets are concerned, it is still in the rumor stage.



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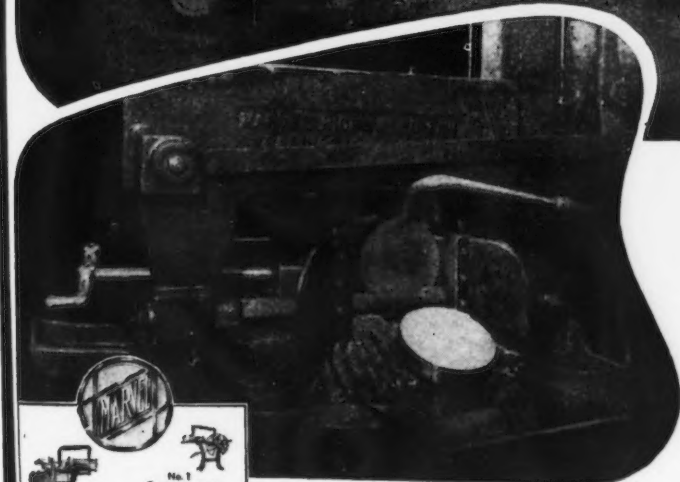
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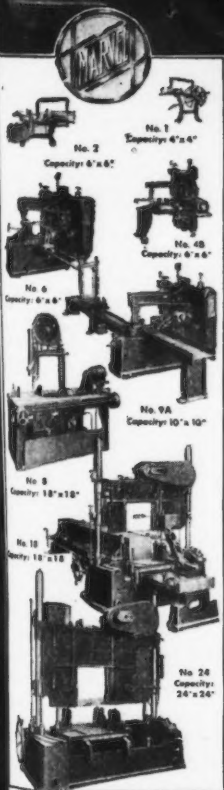
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# NONFERROUS METALS

... News and Market Activities

## Copper Price Brings Out Heavy Tonnages

New York

... Deliveries of copper to customers in March totaled 123,590 tons as reported by the Copper Institute, a good tonnage considering that the government stockpile was practically exhausted at the end of the month. This tonnage was made possible by peak production of primary and secondary copper and refined metal, and by 4918 tons decrease in refined stocks at refineries, on consignment and in exchange warehouses. Primary production in March reached 75,332 tons, 6320 more than February and higher than any previous production figure this year or last. Secondary production reached 8938 tons in March, 3489 more than in February and a similar high point. Refined production reached 88,131 tons in March, 10,540 higher than the previous months, another high point. Refined stocks at the end of the month were 69,727 tons, the low point since April 1946.

These production figures indicate the effectiveness of the high current copper price in bringing out increased tonnages from mines, smelters and refineries.

## Zinc

... Producers report that the zinc market is quiet, with production adequate to meet domestic and export demand. As a result the stock reported by the American Zinc Institute at the end of March, 162,049 tons, was practically the same as the previous month. In the past several weeks the critically short position of

Prime Western and Special High Grade has been moderated. These grades are still relatively tight but some consumers are no longer taking all metal of these grades being offered to them. However there are others who are willing to take tonnages beyond their own quotas and eagerly buying the additional metal. March slab zinc production at 75,376 tons set a long term record which has not been exceeded since 1944.

## Vote 2-Year Suspension

Washington

... H. R. 2404, suspending the copper import duty for a 2-year period, has been approved by the Senate Finance Committee. Except for an amendment excluding copper sulfate, the legislation sent to the Senate floor is identical with the House-approved bill. Should the Senate approve the measure in its present form, the House will have to agree to the copper sulfate proviso or the issue will go to a House-Senate conference for ultimate decision.

## Lead

... Producers report that the plight of lead consumers has been relieved considerably by the high rate of primary and secondary production over the last few months. Production has been well in excess of anticipated production. Consumers have been able to obtain in the last few weeks almost all the lead they need. It has been observed that consumers have become more cautious about their buying policy recently as a result of the general talk of a coming recession, even where their

own business has not been affected as yet. Some consumers have modified their lead requirements as the result of shortages of other materials. Cable producers' operations have been curtailed by the shortage of copper; battery makers', by the shortage of containers. February mine production of lead as reported by the Bureau of Mines was 29,546 tons as compared with a 1946 monthly average of 27,706 tons. The increase is primarily in the western states. Smelters' receipts of lead scrap and recovery of lead during January hit long time peaks of 59,444 tons and 43,733 tons, respectively.

## Copper

... Consumers are desperately in need of copper and must continue in that situation for some time even after the copper tariff is suspended because Chilean producers are reported to have made commitments for their tonnage for the second and third quarters. The question of a copper price increase comes up for consideration again in view of the report that a significant tonnage has been sold at 23.75¢ f.a.s. New York, 2.25¢ over the domestic price. Upon suspension of the tariff and the beginning of Chilean shipments to the United States, it is difficult to believe that those producers would be inclined to sell f.o.b. shipping point to foreign consumers at several cents per pound above the price to United States consumers. On the other hand producers generally do not wish to see the copper price go higher in order to prevent any more widespread replacement of copper by other metals. One factor which is believed to have had much effect on the current shortage of copper is the tendency of fabricators and dealers to hold back in anticipation of higher scrap prices when and if copper moves up.

## Nonferrous Metals Prices

Cents per pound

	Apr. 9	Apr. 10	Apr. 11	Apr. 12	Apr. 14	Apr. 15
Copper, electro, Conn.....	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.....	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York.....	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis.....	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis.....	14.80	14.80	14.80	14.80	14.80	14.80



# NONFERROUS METALS PRICES

## Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	\$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	\$27.50
Cadmium, del'd	\$1.75
Cobalt, 97-99% (per lb)	\$1.50 to \$1.57
Copper, electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per troy oz.	\$35.00
Iridium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110.00
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$88.00 to \$90.00
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$63 to \$66
Silver, New York, cents per oz.	76.00
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr	\$8.75

## Remelted Metals

### Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	21.50
No. 120	21.30
No. 123	20.50
80-10-10 ingot	
No. 305	25.25
No. 315	23.50
88-10-2 ingot	
No. 210	23.25
No. 215	27.25
No. 245	23.75
Yellow ingot	
No. 405	17.00
Manganese Bronze	
No. 421	19.25

### Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	17.50
0.60 copper, max.	17.00
Piston alloys (No. 122 type)	15.50
No. 12 alum. (No. 2 grade)	15.00
108 alloy	15.25
195 alloy	15.75
AXS-679	15.50
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-97½ pct	16.00
Grade 2—92 pct-95 pct	15.00
Grade 3—90 pct-92 pct	14.25
Grade 4—85 pct-90 pct	13.75

## Electroplating Supplies

### Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	36%
Electrodeposited	31%
Rolled, oval, straight, delivered	32%
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33
Zinc, Cast, 99.99	18%
Nickel, 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver, 999 fine	
Rolled, 1000 oz lots, per oz.	88½

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	40.50
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt. allowed	14.50
Silver cyanide, 100 oz. lots, per oz 70%	
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 89 pct, crystals, bbls, frt. allowed	7.75

## Mill Products

### Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

### Magnesium

(Cents per lb, f.o.b. mill, Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSA. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, \$1.25-\$1.31; 24, \$1.71-\$1.75.

Round Rod, Square and Hexagonal Bar: M, diam, in. ¼ to ½, 55¢; ½ to ¾, 52.5¢; ¾ to 1 in. and over, 52¢. Other alloys higher.

Extruded Solid Shapes and Rectangles: M, form factors 1 to 4, 52¢; 5 to 10, 53.5¢; 14 to 16, 56.5¢; 20 to 22, 61¢; 26 to 28, 68¢. Other alloys higher.

Tubing: M, based on weight in pounds per linear foot, 2 lb. and over, 55¢; 1 to 1.5, 58.5¢; 0.5 to 0.7, 64¢; 0.35 to 0.4, 69¢; 0.25 to 0.3, 73¢; 0.15 to 0.2, 81¢; 0.085 to 0.10, 96¢; 0.05 to 0.06, \$1.14; 0.04 to 0.045, \$1.28. Other alloys higher.

### Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	41	
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

### Zinc

(Cents per lb, f.o.b. mill)

Sheet, L.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

### Copper, Brass, Bronze

(Cents per lb)

	Extruded Shapes	Rods	Sheets
Copper	32.78		32.93
Copper, hot rolled		29.28	
Copper, drawn		30.28	
Low brass	39.13	30.32	30.63
High brass	32.30	29.58	29.89
Red brass	39.74	30.93	31.24
Naval brass	28.73	27.48	33.42
Brass, free cutting	27.23	23.64	
Commercial bronze	40.86	32.05	32.36
Manganese bronze	32.28	30.78	36.92
Phosphor bronze,			
5 pct.		50.98	50.75
Muntz metal	28.42	27.17	31.61
Everdur, Herculey			
Olympic, etc	36.30	34.80	37.71
Nickel silver, 5 pct.	40.54	39.53	37.92
Architectural bronze	27.23		

## Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

### Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

### Copper and Brass

No. 1 heavy copper and wire	17 — 17½
No. 2 heavy copper and wire	16 — 16½
Light copper	15 — 15½
Auto radiators (unsweated)	10½ — 11½
No. 1 composition	14½ — 15
No. 1 composition turnings	13½ — 14
Clean red car boxes	12 — 12½
Cocks and faucets	11½ — 12
Mixed heavy yellow brass	9½ — 10½
Old rolled brass	9½ — 10
Brass pipe	11½ — 11¾
New soft brass clippings	13 — 13½
Brass rod ends	12½ — 13
No. 1 brass rod turnings	12 — 12½

### Aluminum

Alum. pistons with struts	4½ — 5
Aluminum crankcases	6½ — 7
2S aluminum clippings	8 — 8½
Old sheet & utensils	6½ — 6¾
Mixed borings and turnings	2 — 2½
Misc. cast aluminum	6 — 6½
Dural clips (24S)	5½ — 6

### Zinc

New zinc clippings	7 — 7½
Old zinc	5½ — 5¾
Zinc routings	3 — 3½
Old die cast scrap	3 — 3½

### Nickel and Monel

Pure nickel clippings	22 — 23
Clean nickel turnings	17 — 18
Nickel anodes	19½ — 20½
Nickel rod ends	20 — 21
New Monel clippings	14 — 15
Clean Monel turnings	9 — 10
Old sheet Monel	12 — 12½
Old Monel castings	10 — 11
Inconel clippings	10 — 11
German silver clippings, mixed	10½ — 11
German silver turnings, mixed	7 — 7½

### Lead

Soft scrap lead	12½ — 13
Battery plates (dry)	7 — 7½

### Miscellaneous

Block tin	60
No. 1 pewter	46 — 48
No. 1 auto babbitt	35 — 36
Mixed common babbitt	12 — 12½
Solder joints	13½ — 13¾
Siphon tops	38 — 39
Small foundry type	15 — 15½
Monotype	13½ — 14
Lino and stereotype	12 — 13
Electrotype	11 — 12
New type shell cuttings (nom)	13 — 13½
Clean hand picked type shells	5½ — 6
Lino and stereo dross	6 — 6½
Electro dross	4 — 4½

### Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

## Prices Drift Lower on Good Shipments

### New York

... Good shipments, lower prices, and very little steel mill scrap buying featured this week's markets. Most mills have been out of the market for weeks but the downward scrap price trend is bringing out many a loose ton of steel.

Dealers are pushing out material because peddlers are selling it to them in better volume than they've seen in years, and dealers want to get these prices while they last. Brokers too are struggling to meet contract deadlines before current agreements are

*Additional scrap news appears on pp. 102-103 of this issue.*

scrapped in favor of cheaper contracts. Another sign of the times is closer mill inspection of incoming shipments for overgrading.

Average declines chalked up this week include \$1 at Pittsburgh, Philadelphia and New York; \$2.75 at Cleveland and 75¢ in the Youngstown area. Detroit was off \$1.50 on the average.

Cast supply was looking better, but to date there are no signs of the sharp price weakness shown in steelmaking grades. In the face of better No. 1 cast volume, Philadelphia was off an average of \$1 a gross ton, Cleveland was down \$3; elsewhere it was fairly steady. Malleable was stronger than ever.

**PITTSBURGH**—Broker offerings totaling better than 1000 tons of openhearth grade scrap to two mills this past week for \$37 a ton were turned down by the mills. While this tonnage was not large, it represented the activity in the market for the week since no new orders were forthcoming. Lower eastern prices trimmed \$1 a ton off the top range for Pittsburgh, bringing the spread to \$37 to \$38 a ton on the heavy melting openhearth grades. Mills are inspecting scrap closer; one is rigidly rejecting cars of prepared scrap containing too much unprepared. With shippers culling scrap closely for foundries material it doesn't appear that the No. 1 and No. 2 grade differential will return for some time. However, one eastern consumer is reported to be buying No. 1 busheling for \$2 a ton less than the No. 1 heavy melting price. The decline in eastern demand for heavy breakable cast caused a drop

of \$5 a ton this week in the Pittsburgh price.

**CHICAGO**—Large orders at the new price have not yet been placed although representative tonnages are moving at \$33.50 in heavy melting items. Some brokers are still scrambling to cover existing contracts. At least one mill is planning to cancel all old contracts at the earliest possible moment. Railroad specialties continue to vary widely in price. Malleable iron which had shown a slight weakness for a few weeks jumped considerably with the return to the market of several large consumers.

**PHILADELPHIA**—Mills are reordering normally again and the price of heavy melting grades in this market has dropped another dollar to a range of \$33 to \$34. Turnings have also dropped \$1 but shoveling only 50¢. Low phos grades declined \$1, railroad specialties \$2.50. There is a definite softening trend in the cast market with all grades dropping \$1. Railroad malleable continues scarce and strong at the former price level.

**NEW YORK**—Dealers are breaking their backs to move everything loose in the face of the downward price trend. Brokers are doing the same because high priced contracts are running into cancellation dates. Though one buyer was paying \$31.79 on Monday all other large brokers were paying \$30.50 to \$31 and the \$31.79 figure was not expected to hold long. South Jersey foundries have now reduced their No. 1 cupola cast buying prices by \$2 in the past two weeks.

**DETROIT**—With large mill buyers both local and outstate withdrawing from the market, scrap prices fell again this week and the prospects were that the drop would continue until large buyers are again in a buying mood. Both openhearth and cast grades are appreciably softer here and the indications are that both a plentiful supply of scrap and the prospect of a steel strike may be influencing buyers. For the first time since OPA withdrew, the price of earmarked scrap was reported to be higher than open market quotations and some sources believed that this may herald an early abandonment of the present practices of earmarking scrap for individual mills.

**CLEVELAND**—Terrific shipments and the absence of any definite buying by major consumers were dominant factors in the market this week as openhearth scrap prices continued their downward spiral. Foundry grades continued strong, and malleable was bringing \$50 for shipment to consumers outside the district. This week will see the end of the old, high priced orders, and the real test of the market will take place shortly. Growing possibilities of a steel strike are said to

be keeping some consumers out of the market at the moment, but some major consumers here and in the valley will probably stay out of the market until the middle of May.

**BOSTON**—Market apparently is in another digestive stage. On new business, of which there is little, \$29 a ton for heavy steel is the going price. Current activity concerns cleaning up old contracts on the basis of \$31. If all these old order completions are criteria, a whale of a lot of steel heretofore not reported sold is being taken by mills. Largest cast consumers are temporarily out of the market, giving the little fellow a break. Littlers outside Boston still paying \$50, \$55, and up to \$65 a ton delivered and mighty glad to get it.

**BUFFALO**—Openhearth scrap was \$2 to \$3 lower this week and easy at the decline. A leading consumer bought moderately at \$35 but later efforts to sell more at this figure were unavailing. The mill that cancelled high priced orders on Apr. 15 was out of the market until May 1. Turnings and borings slipped another dollar and low phos plate dropped \$2. Resistance to asking prices for cast scrap was reported stronger although no marked increase in supply was evident.

**CINCINNATI**—The market is in a watchful waiting mood. Prices are unchanged during the current week, and in some instances material seems to be a trifle easier. Brokers and dealers are avoiding too long a position on any of the current offerings. Steel mills, for the most part, are in pretty good shape, so far as their inventories are concerned, but the cast grades are still being taken as material is offered.

**BIRMINGHAM**—Fearing a steel strike and anticipating a further decline in prices, consumers in this area were out of the scrap market at the beginning of the week. Large tonnages were being offered without takers and quoted prices are purely nominal—the prices for last sales.

**TORONTO**—Improvement in weather conditions has been reflected in a slight gain in scrap iron and steel receipts, especially offerings from the rural districts. However, incoming scrap is still only about 20 pct of actual requirements and consumers' stocks are dwindling rapidly. Most of the scrap appearing on the market is secondary grades with only small lots of No. 1 steel scrap or iron scrap coming out at irregular intervals. Reliable sources say that Canadian steel mills now are negotiating for a fairly large tonnage of scrap from Europe, and there seems little prospect of the domestic market providing enough for 1947 needs. While sizable tonnages of scrap could be collected in the farm communities, it is said collectors are not interested at prevailing ceiling prices.



# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$37.00 to \$38.00
RR. hvy. melting.....	37.50 to 38.00
No. 2 hvy. melting.....	37.00 to 38.00
RR. scrap rails.....	42.00 to 43.00
Rails 2 ft. and under.....	46.00 to 47.00
No. 1 comp'd bundles.....	37.00 to 38.00
Hand bld. new shts.....	37.00 to 38.00
Hvy. axle turn.....	37.00 to 37.50
Hvy. steel forge turn.....	37.00 to 37.50
Mach. shop turn.....	29.00 to 30.00
Short. shov. turn.....	31.00 to 32.00
Mixed bor. and turn.....	29.00 to 30.00
Cast iron borings.....	29.00 to 30.00
No. 1 cupola cast.....	45.50 to 46.50
Heavy breakable cast.....	33.00 to 34.00
Malleable.....	44.00 to 45.00
RR. knuck. and coup.....	44.00 to 45.00
RR. coil springs.....	44.00 to 45.00
Rail leaf springs.....	44.00 to 45.00
Roller steel wheels.....	44.00 to 45.00
Low phos.....	41.00 to 42.00

## CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$33.00 to \$33.50
No. 2 hvy. melting.....	33.00 to 33.50
No. 1 bundles.....	33.00 to 33.50
No. 2 dealers' bundles.....	33.00 to 33.50
Bundled mach. shop turn.....	33.00 to 33.50
Galv. bundles.....	31.00 to 32.00
Mach. shop turn.....	28.00 to 29.00
Short shov. turn.....	30.00 to 31.00
Cast iron borings.....	29.50 to 30.00
Mix. borings & turn.....	28.00 to 29.00
Low phos. hvy. forge.....	38.50 to 39.00
Low phos. plates.....	36.00 to 36.50
No. 1 RR. hvy. melt.....	33.00 to 34.50
Rerolling rails.....	39.00 to 41.00
Miscellaneous rails.....	36.50 to 39.00
Angles & splice bars.....	40.50 to 41.00
Locomotive tires, cut.....	41.00 to 42.00
Cut bolster & side frames.....	38.00 to 38.50
Standard stl. car axles.....	38.50 to 39.00
No. 3 steel wheels.....	37.50 to 39.50
Couplers & knuckles.....	39.00 to 39.50
Malleable.....	47.00 to 50.00
No. 1 mach. cast.....	43.00 to 44.00
Rails 2 ft. and under.....	42.00 to 42.50
No. 1 agricul. cast.....	38.50 to 39.00
Hvy. breakable cast.....	35.00 to 36.00
RR. grate bars.....	39.00 to 39.50
Cast iron brake shoes.....	39.00 to 39.50
Cast iron carwheels.....	39.00 to 40.00

## CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$32.00 to \$33.00
No. 2 hvy. melting.....	32.00 to 33.00
No. 1 bundles.....	32.00 to 33.00
No. 2 bundles.....	32.00 to 33.00
Mach. shop turn.....	27.00 to 28.00
Shoveling turn.....	28.00 to 29.00
Cast iron borings.....	27.00 to 28.00
Mixed bor. & turn.....	27.00 to 28.00
Low phos. plate.....	36.00 to 37.00
No. 1 cupola cast.....	45.00 to 47.00
Hvy. breakable cast.....	34.00 to 35.00
Scrap rails.....	38.00 to 39.00

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting.....	\$29.00 to \$31.00
No. 2 hvy. melting.....	29.00 to 31.00
Nos. 1 and 2 bundles.....	29.00 to 31.00
Busheling.....	29.00 to 31.00
Turnings, shovellings.....	23.00
Machine shop turn.....	21.00
Mixed bor. & turn.....	21.00
Cl'n cast. chem. bor.....	23.00 to 28.00
No. 1 machinery cast.....	40.00 to 45.00
No. 2 machinery cast.....	40.00 to 45.00
Heavy breakable cast.....	40.00 to 45.00
Stove plate.....	40.00 to 45.00

## DETROIT

Per gross, ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting.....	\$30.50 to \$31.00
No. 2 hvy. melting.....	30.50 to 31.00
No. 1 bundles.....	30.50 to 31.00
New busheling.....	30.50 to 31.00
Flashings.....	30.50 to 31.00
Mach. shop turn.....	22.50 to 23.00
Short shov. turn.....	23.50 to 24.00
Cast iron borings.....	23.50 to 24.00
Mixed bor. & turn.....	23.50 to 24.00
Low phos. plate.....	32.50 to 33.00
No. 1 cupola cast.....	36.00 to 40.00
Hvy. breakable cast.....	31.00 to 33.00
Stove plate.....	33.00 to 35.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$33.00 to \$34.00
No. 2 hvy. melting.....	33.00 to 34.00
No. 1 bundles.....	33.00 to 34.00
No. 2 bundles.....	33.00 to 34.00
Mach. shop turn.....	24.00 to 25.00
Shoveling turn.....	25.50 to 26.50
Mixed bor. & turn.....	24.00 to 25.00
Clean cast chemical bor.....	31.50 to 32.50
No. 1 cupola cast.....	47.00 to 49.00
Hvy. breakable cast.....	44.00 to 45.00
Cast. charging box.....	44.00 to 45.00
Clean auto cast.....	47.00 to 49.00
Hvy. axle forge turn.....	33.00 to 34.00
Low phos. plate.....	38.00 to 39.00
Low phos. punchings.....	38.00 to 39.00
Low phos. bundles.....	37.00 to 38.00
RR. steel wheels.....	40.00 to 41.00
RR. coil springs.....	40.00 to 41.00
RR. malleable.....	48.00 to 50.00

## ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$33.50 to \$34.50
Bundled sheets.....	32.50 to 33.50
Mach. shop turn.....	22.00 to 23.00
Locomotive tires, uncut.....	36.00 to 37.00
Mis. std. sec. rails.....	37.00 to 38.00
Rerolling rails.....	37.50 to 38.50
Steel angle bars.....	39.00 to 40.00
Rails 3 ft. and under.....	41.00 to 43.00
RR. steel springs.....	38.00 to 39.00
Steel car axles.....	38.00 to 40.00
Stove plate.....	36.00 to 38.00
Grate bars.....	35.00 to 36.00
Brake shoes.....	35.00 to 36.00
Malleable.....	47.00 to 49.00
Cast iron car wheels.....	42.00 to 43.00
No. 1 machinery cast.....	40.00 to 41.00
Breakable cast.....	36.00 to 37.00

## BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$33.00
No. 2 hvy. melting.....	33.00
No. 2 bundles.....	33.00
No. 1 busheling.....	33.00
Long turnings.....	23.00
Shoveling turnings.....	25.00
Cast iron borings.....	24.00
Bar crops and plate.....	36.00 to 37.00
Structural and plate.....	36.00 to 37.00
No. 1 cast.....	37.50 to 42.50
Stove plate.....	37.00 to 38.00
Steel axles.....	33.00
Scrap rails.....	33.00 to 34.00
Rerolling rails.....	36.00 to 37.00
Angles & splice bars.....	37.00 to 38.00
Rails 3 ft. & under.....	37.00 to 38.00
Cast iron carwheels.....	32.00 to 32.50

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$34.50 to \$35.00
No. 2 hvy. melting.....	34.50 to 35.00
Low phos. plate.....	39.00 to 39.50
Mach. shop turn.....	28.50 to 29.00
Short shov. turn.....	30.50 to 31.00
Cast iron borings.....	30.50 to 31.00
Elec. furnace punch.....	39.00 to 40.00

## NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting.....	\$30.50 to \$31.00
No. 2 hvy. melting.....	30.50 to 31.00
Comp. black bundles.....	30.50 to 31.00
Comp. galv. bundles.....	28.50 to 29.00
Mach. shop turn.....	20.50 to 21.00
Mixed bor. & turn.....	20.50 to 21.00
Shoveling turn.....	21.50 to 22.00
No. 1 cupola cast.....	42.00 to 43.00
Hvy. breakable cast.....	40.00 to 41.00
Charging box cast.....	40.00 to 41.00
Stove plate.....	40.00 to 41.00
Clean auto cast.....	40.00 to 41.00
Unstrip. motor blks.....	38.00 to 39.00
Cl'n chem. cast bor.....	24.00

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$34.00 to \$35.00
No. 2 hvy. melting.....	34.00 to 35.00
No. 1 bundles.....	34.00 to 35.00
No. 2 bundles.....	34.00 to 35.00
No. 1 busheling.....	34.00 to 35.00
Mach. shop turn.....	24.00 to 25.00
Shoveling turn.....	26.00 to 27.00
Cast iron borings.....	24.00 to 25.00
Mixed bor. & turn.....	24.00 to 25.00
No. 1 cupola cast.....	40.00 to 45.00
Charging box cast.....	29.00 to 30.00
Stove plate.....	30.00 to 35.00
Clean auto cast.....	35.00 to 40.00
Malleable.....	45.00 to 47.00
Low phos. plate.....	37.00 to 39.00
Scrap rails.....	32.00 to 35.00
Rails 3 ft. & under.....	40.00 to 43.00
RR. steel wheels.....	40.00 to 43.00
Cast iron carwheels.....	40.00 to 43.00
RR. coil & leaf spgs.....	40.00 to 43.00
RR. knuckles & coup.....	40.00 to 43.00

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$32.50 to \$33.00
No. 2 hvy. melting.....	32.50 to 33.00
Compressed sheet stl.....	32.50 to 33.00
Drop forge flashings.....	32.50 to 33.00
No. 2 bundles.....	32.50 to 33.00
Mach. shop turn.....	28.00 to 28.50
Short shovel.....	29.00 to 29.50
No. 1 busheling.....	32.50 to 33.00
Steel axle turn.....	32.50 to 33.00
Cast iron borings.....	29.00 to 29.50
Mixed bor. & turn.....	29.00 to 29.50
No. 1 machinery cast.....	42.00 to 43.00
Malleable.....	45.00 to 50.00
Railroad cast.....	42.00 to 43.00
Railroad grate bars.....	39.00 to 40.00
Stove plate.....	39.00 to 40.00
RR. hvy. melting.....	37.00 to 37.50
Rails 3 ft. & under.....	44.00 to 45.00
Rails 13 in. & under.....	45.00 to 46.00
Elec. furnace punch.....	37.00 to 37.50

## SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$19.50
No. 2 hvy. melting.....	19.50
No. 2 bales.....	19.50
No. 3 bales.....	16.00
Mach. shop turn.....	13.00
Elec. furn. 1 ft. und.....	25.00
No. 1 cupola cast.....	\$32.00 to 33.00
RR. hvy. melting.....	20.00

## LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting.....	\$19.50
No. 2 hvy. melting.....	19.50
No. 1 bales.....	19.50
No. 2 bales.....	19.50
No. 3 bales.....	16.00
Mach. shop turn.....	14.50
No. 1 cupola cast.....	\$35.00 to 36.00
RR. hvy. melting.....	20.50

## SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melting.....	\$20.00
Elec. furn. 1 ft. und.....	24.00
No. 1 cupola cast.....	29.00
RR. hvy. melting.....	21.00

## HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point

Heavy melting.....	\$17.50*
No. 1 bundles.....	17.50*
No. 2 bundles.....	17.00*
Mixed steel scrap.....	15.50*
Rails, remelting.....	18.50*
Rails, rerolling.....	21.50*
Bushelings.....	13.00*
Mixed borings & turnings.....	12.50*
Electric furnace bundles.....	20.50*
Manganese steel scrap.....	20.00*
No. 1 cast.....	19.00*
Stove plate.....	17.50*
Car wheels, cast.....	19.50*
Malleable iron.....	16.00*

\* Ceiling price

# Comparison of Prices . .

Advances over past week in Heavy Type, declines in Italics. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(cents per pound)				
Hot-rolled sheets	2.50	2.50	2.50	2.425
Cold-rolled sheets	3.20	3.20	3.20	3.275
Galvanized sheets (10 ga.)	3.55	3.55	3.55	4.05*
Hot-rolled strip	2.50	2.50	2.50	2.35
Cold-rolled strip	3.20	3.20	3.20	3.05
Plates	2.65	2.65	2.65	2.50
Plates, wrought iron	5.95	5.95	5.95	4.112
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00
*24 ga				

Tin and Terneplate:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(dollars per base box)				
Tinplate, standard cokes	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30

Bars and Shapes:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(cents per pound)				
Merchant bars	2.60	2.60	2.60	2.50
Cold-finished bars	3.20	3.20	3.20	3.10
Alloy bars	3.05	3.05	3.05	2.92
Structural shapes	2.50	2.50	2.50	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	24.00
Wrought iron bars	6.15	6.15	6.15	4.76

Wire and Wire Products:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(cents per pound)				
Bright wire	3.30	3.30	3.30	3.05
Wire nails	3.75	3.75	3.75	3.25

Rails:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(dollars per 100 lb)				
Heavy rails	\$2.50	\$2.50	\$2.50	\$43.39*
Light rails	2.85	2.85	2.85	49.18*
*per net ton				

Semifinished Steel:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(dollars per gross ton)				
Rerolling billets	\$42.00	\$42.00	\$42.00	\$39.00
Sheet bars	50.00	50.00	50.00	38.00
Slabs, rerolling	42.00	42.00	42.00	39.00
Forging billets	50.00	50.00	50.00	47.00
Alloy blooms, billets, slabs	61.00	61.00	61.00	58.43

Wire Rods and Skelp:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(cents per pound)				
Wire rods	2.55	2.55	2.55	2.30
Skelp	2.35	2.35	2.35	2.05

Pig Iron:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(per gross ton)				
No. 2, foundry, Phila.	\$36.51	\$36.51	\$36.51	\$28.34
No. 2, Valley furnace	33.50	33.50	33.50	26.50
No. 2, Southern, Cin'ti	34.75	34.75	34.75	26.94
No. 2, Birmingham	29.88	29.88	29.88	22.88
No. 2, foundry, Chicago†	33.00	33.00	33.00	26.50
Basic, del'd eastern Pa.	36.92	36.92	36.92	27.84
Basic, Valley furnace	33.00	33.00	33.00	26.00
Malleable, Chicago†	33.50	33.50	33.50	26.50
Malleable, Valley	33.50	33.50	33.50	26.50
Charcoal, Chicago	45.99	45.99	45.99	42.34
Ferromanganese†	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.  
‡ For carlots at seaboard.

Scrap:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(per gross ton)				
Heavy melt'g steel, P'gh.	\$37.50	\$38.50	\$41.00	\$20.00
Heavy melt'g steel, Phila.	33.50	34.50	40.75	18.75
Heavy melt'g steel, Ch'go	33.25	33.25	37.25	18.75
No. 1, hy. comp. sheet, Det.	30.75	32.25	35.00	17.32
Low phos. plate, Youngs'n	39.25	40.50	45.25	22.50
No. 1, cast, Pittsburgh	46.00	46.00	44.50	20.00
No. 1, cast, Philadelphia	48.00	49.00	50.00	20.00
No. 1, cast, Chicago	43.50	43.50	46.50	20.00

Coke, Connellsville:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(per net ton at oven)				
Furnace coke, prompt	\$9.00	\$9.00	\$9.00	\$7.50
Foundry coke, prompt	10.25	10.25	10.25	9.00

Nonferrous Metals:	Apr. 15, 1947	Apr. 8, 1947	Mar. 18, 1947	Apr. 16, 1946
(cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	12.00
Copper, Lake, Conn.	21.625	21.625	21.625	12.00
Tin, Straits, New York	80.00	80.00	70.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	8.25
Lead, St. Louis	14.80	14.80	14.80	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

# Composite Prices . .

## FINISHED STEEL

Apr. 15, 1947	2.86354¢ per lb.
One week ago	2.86354¢ per lb.
One month ago	2.86354¢ per lb.
One year ago	2.73011¢ per lb.

HIGH	LOW
1947.... 2.86354¢	2.86354¢
1946.... 2.83599¢ Dec. 31	2.54490¢ Jan. 1
1945.... 2.44104¢ Oct. 2	2.38444¢ Jan. 2
1944.... 2.30837¢ Sept. 5	2.21189¢ Oct. 5
1943.... 2.29176¢	2.29176¢
1942.... 2.28249¢	2.28249¢
1941.... 2.43078¢	2.43078¢
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.... 2.35367¢ Jan. 3	2.26689¢ May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935.... 2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934.... 2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933.... 1.95578¢ Oct. 3	1.75836¢ May 2
1932.... 1.89196¢ July 5	1.83901¢ Mar. 1
1931.... 1.99626¢ Jan. 13	1.86586¢ Dec. 29
1930.... 2.25488¢ Jan. 7	1.97319¢ Dec. 9
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 23, 1941, issue.

## PIG IRON

.....\$33.15 per gross ton.....
.....\$33.15 per gross ton.....
.....\$33.15 per gross ton.....
.....\$26.12 per gross ton.....

HIGH	LOW
\$33.15 Mar. 11	\$30.14 Jan. 7
30.14 Dec. 10	25.37 Jan. 1
25.37 Oct. 23	23.61 Jan. 2
\$23.61	\$23.61
23.61	23.61
23.61	23.61
\$23.61 Mar. 20	\$23.45 Jan. 2
23.45 Dec. 23	22.61 Jan. 2
22.61 Sept. 19	20.61 Sept. 12
23.25 June 21	19.61 July 6
23.25 Mar. 9	20.25 Feb. 16
19.74 Nov. 24	18.73 Aug. 11
18.84 Nov. 5	17.83 May 14
17.90 May 1	16.90 Jan. 27
16.90 Dec. 5	13.56 Jan. 3
14.81 Jan. 5	13.56 Dec. 6
15.90 Jan. 6	14.79 Dec. 15
18.21 Jan. 7	15.90 Dec. 16
18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

## SCRAP STEEL

.....\$34.75 per gross ton.....
.....\$35.42 per gross ton.....
.....\$39.67 per gross ton.....
.....\$19.17 per gross ton.....

HIGH	LOW
\$39.67 Mar. 18	\$31.00 Jan. 7
31.17 Dec. 24	19.17 Jan. 1
19.17 Jan. 2	18.92 May 22
19.17 Jan. 11	15.76 Oct. 24
\$19.17	\$19.17
19.17	19.17
\$22.00 Jan. 7	\$19.17 Apr. 10
21.83 Dec. 30	16.04 Apr. 9
22.50 Oct. 3	14.08 May 16
15.00 Nov. 22	11.00 June 7
21.92 Mar. 30	12.67 June 9
17.75 Dec. 21	12.67 June 8
13.42 Dec. 10	10.33 Apr. 29
13.00 Mar. 13	9.50 Sept. 25
12.25 Aug. 8	6.75 Jan. 3
8.50 Jan. 12	6.43 July 5
11.33 Jan. 6	8.50 Dec. 29
15.00 Feb. 18	11.25 Dec. 9
17.53 Jan. 29	14.08 Dec. 8

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



Whether you're in a hurry — or have lots of time —

call us for **Steel**



**W**E hope you aren't always in a "jam" when you call us for steel. But when you are, we will give you the fastest possible service. And for anticipated needs, you can depend upon us to give your orders exacting attention.

Whether you need a pound or a ton of steel—whether you require Stainless, High Strength or Alloy Steels... Hot Rolled or Cold Finished Bars, Structural Shapes, Plates, Sheets, Machinery, etc.—call, wire or write our warehouse nearest you for prompt, dependable service.

## Symbol of Service

FOR STEEL USERS



### UNITED STATES STEEL SUPPLY COMPANY

CHICAGO (90)	1319 Wabansia Ave., P. O. Box MM	BRUnswick 2000	NEWARK (1), N. J.	Foot of Bessemer St., P. O. Box 479	Blgelow 3-5920 REctor 2-6560, BErgen 3-1614
BALTIMORE (3)	Bush & Wicomico Sts., P. O. Box 2036	GIlmor 3100			
BOSTON	176 Lincoln St., (Allston 34), P. O. Box 42	STAdium 9400	PITTSBURGH (12)	1281 Reedsdale Street, N. S.	CEdar 7780
CLEVELAND (14)	1394 East 39th St.	HEnderson 5750	ST. LOUIS (3)	21st & Gratiot Sts., P. O. Box 27	MAIn 5235
MILWAUKEE (1)	4027 West Scott St., P. O. Box 2045	MIItchell 7500	TWIN CITY	2545 University Ave., St. Paul (4), Minn.	NEstor 7311

# UNITED STATES STEEL

# Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) This base price for annealed, bright finish wire, commercial spring wire. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6 (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices; includes 3 pct freight tax. (15) 0.035 to 0.075 in. thick by 3/4 to 3 1/2 in. wide. (16) Some producers are charging 2.75c. (17) Delivered Los Angeles; add 1/2c per 100 lb for San Francisco. (18) Delivered Los Angeles only.

Basing Points	Pitts- burgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio		San Francisco, Los Angeles, Seattle	DELIVERED TO				
													Detroit	New York	Phila- delphia		
INGOTS																	
Carbon, rerolling	(\$35.00 f. o. b. mill)																
Carbon, forging	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00										
Alloy	\$52.00																
Canton = \$52.00																	
BILLETS, BLOOMS, SLABS																	
Carbon, rerolling	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00						\$45.00			
(Provo = \$53.20)																	
Carbon, forging billets	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00						\$53.00			
(Provo = \$61.20, Duluth = \$52.00 <sup>13</sup> )																	
Alloy	\$61.00	\$61.00				\$61.00								\$64.00			
(Bethlehem, Massillon, Canton = \$61.00)																	
SHEET BARS																	
							\$53.00			Portsmouth, Ohio = \$67.20							
(Coatesville = 2.35¢)																	
PIPE SKELP																	
	2.35¢	2.35¢					2.35¢	2.35¢									
WIRE RODS																	
	2.55¢	2.55¢		2.55¢	2.55¢								3.27¢ <sup>13</sup>				
(Worcester = 2.65¢)																	
SHEETS																	
Hot-rolled	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.875¢	2.50¢			3.24¢ <sup>17</sup>	2.65¢	2.79¢		
Cold-rolled <sup>1</sup>	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	3.20¢		3.30¢					3.35¢	3.61¢		
Galvanized (10 gage)	3.55¢	3.55¢	3.55¢		3.55¢		3.55¢	3.55¢	3.65¢				4.32¢ <sup>17</sup>		3.84¢		
Enameling (12 gage)	3.55¢	3.55¢	3.55¢	3.55¢			3.55¢		3.65¢					3.70¢	3.95¢		
Long ternes <sup>2</sup> (10 gage)	3.55¢	3.55¢	3.55¢												3.91¢		
STRIP																	
Hot-rolled <sup>3</sup>	2.50¢	2.50¢	2.50¢	2.50¢ <sup>15</sup>	2.50¢		2.50¢							2.65¢	2.93¢		
Cold-rolled <sup>4</sup>	3.20¢	3.30¢		3.20¢			3.20¢							3.35¢	3.61¢		
(Worcester = 3.40¢)																	
Cooperage stock	2.80¢	2.80¢			2.80¢		2.80¢								3.09¢		
TINPLATE																	
Standard cokes, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85					(Warren, Ohio = \$5.75)	\$6.157		
Electro, box { 0.25 lb. 0.50 lb. 0.75 lb.	Deduct 90¢ from standard coke base box price. Deduct 70¢ from standard coke base box price. Deduct 50¢ from standard coke base box price.																
BLACKPLATE, 29 gage <sup>5</sup>																	
	3.60¢	3.60¢	3.60¢		3.70¢			3.70¢	3.70¢					(Warren, Ohio = \$5.75)	3.99¢		
BLACKPLATE, CANMAKING																	
55 lb. to 70 lb. 75 lb. to 95 lb. 100 lb. to 118 lb.	Deduct \$1.55 from standard coke base box. Deduct \$1.65 from standard coke base box. Deduct \$1.55 from standard coke base box.																
TERNES, MFG., Special coated																	
Deduct 85¢ from standard coke base box price.																	
BARS																	
Carbon steel	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢						3.285¢	2.75¢	3.01¢		
Rail steel <sup>6</sup> , <sup>16</sup>	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢											
Reinforcing (billet) <sup>7</sup>	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢					2.985¢		2.74¢		
Reinforcing (rail) <sup>7</sup> , <sup>16</sup>	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢								2.65¢		
Cold-finished <sup>8</sup>	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢									3.61¢		
(Detroit = 3.25¢)																	
Alloy, hot-rolled	3.05¢	3.05¢				3.05¢	3.05¢							3.20¢	3.19¢		
(Bethlehem, Massillon, Canton = 3.05¢)																	
Alloy, cold-drawn	3.80¢	3.80¢	3.80¢	3.80¢		3.80¢								3.95¢			
PLATE																	
Carbon steel <sup>12</sup>	2.65¢	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢							(Coatesville, Claymont = 2.80¢, Geneva, Utah = 2.80¢)	2.87¢		
2.65¢																	
Floor plates	3.90¢	3.90¢													4.30¢		
Alloy	3.79¢	3.79¢													4.01¢		
(Coatesville = 4.10¢)																	
SHAPES, Structural																	
	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢		(Geneva, Utah = 2.65¢)	(Bethlehem = 2.50¢)				3.17¢ <sup>18</sup>	2.70¢	2.64¢		
SPRING STEEL, C-R																	
0.26 to 0.40 carbon	3.20¢			3.20¢				(Worcester = 3.40¢)									
0.41 to 0.60 carbon	4.70¢			4.70¢				(Worcester = 4.90¢)									
0.61 to 0.80 carbon	5.30¢			5.30¢				(Worcester = 5.50¢)									
0.81 to 1.00 carbon	6.80¢			6.80¢				(Worcester = 7.00¢)									
Over 1.00 carbon	9.10¢			9.10¢				(Worcester = 9.30¢)									
MANUFACTURERS' WIRE <sup>9</sup>																	
Bright <sup>10</sup>	3.30¢	3.30¢		3.30¢	3.30¢			(Worcester = 3.40¢, Duluth = 3.35¢)					5.63¢ <sup>13</sup>	3.71¢	3.68¢		
Galvanized								Add proper size extra and galvanizing extra to Bright Wire Base									
Spring (high carbon)	4.25¢	4.25¢		4.25¢				(Worcester = 4.35¢, Duluth = 4.50¢)	(Trenton = 4.50¢)				5.24¢ <sup>13</sup>	4.66¢	4.595¢		
PILING, Steel sheet																	
	3.00¢	3.00¢					3.00¢								3.41¢		



# PRICES

## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 448
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.....	Subject to negotiation		Subject to negotiation			
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.....	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading.....	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt.....	Subject to negotiation		Subject to negotiation			
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville.....	23.00	22.50	17.50	17.50	21.00	25.50
ars. h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.....	27.50	28.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleva, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.....	27.50	28.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton.....	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi.....	27.50	28.00	20.50	21.00	24.50	30.00
Shapes, P'gh, Chi, Middletown, Canton, Balt.....	39.00	37.00	29.00	31.50	35.50	39.50
Str. h-r, P'gh, Chi, Reading, Canton, Youngstown.....	25.50	23.50	18.50	19.00	28.00	38.00
Strip, c-r, P'gh, Cleva, Newark, N. J., Reading, Canton, Youngstown.....	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleva, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila., Ft. Wayne.....	27.50	28.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleva, Balt, Reading, Dunkirk, Canton.....	32.48	30.30	23.80	24.34	34.62	56.28
Rod, h-r, Syracuse.....	27.05	25.97	20.02	20.58	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 to 8 in.).....	72.09	72.09	.....	68.49	.....	.....

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. \*Also Canton, Ohio)

W	Cr	V	Mo	Base per Pounds
18	4	1	—	74¢
1.5	4	1.5	8	59¢
6	4	2	6	63¢
High-carbon-chromium*				47¢
Oil hardening manganese*				26¢
Special carbon*				24¢
Extra carbon*				20¢
Regular carbon*				16¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

## ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade .....	4.20¢
Armature .....	4.50¢
Electrical .....	5.00¢
Motor .....	5.70¢
Dynamo .....	6.45¢
Transformer 72 .....	6.95¢
Transformer 65 .....	7.65¢
Transformer 58 .....	8.35¢
Transformer 52 .....	9.15¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

## RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb.....	\$2.50
Angle splice bars, 100 lb.....	3.00
(F.o.b. basing points) per 100 lb	
Light rails (from billets).....	\$2.85
Light rails (from rail steel), f.o.b. Williamsport, Pa. ....	2.95

Base per lb

Cut spikes .....	4.50¢
Screw spikes .....	6.40¢
Tie plate, steel .....	2.80¢
Tie plates, Pacific Coast.....	2.95¢
Track bolts .....	6.50¢
Track bolts, heat treated, to rail roads .....	6.75¢
Track bolts, jobbers discount.....	63-5

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, add 25¢.

## ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.....	\$6.75	\$13.50

## CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa. ....	24.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa. ....	21.50	.....
Inconel-clad		
10 pct, f.o.b. Coatesville..	30.00	.....
Monel-clad		
10 pct, f.o.b. Coatesville..	29.00	.....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh .....	9.00	.....

\*Includes annealing and pickling.

## MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per San Francisco
Standard, galvanized and coated nails .....	\$3.75† \$4.83
Cut nails, carloads, Pittsburgh base .....	5.30

†10¢ additional at Cleveland, 30¢ at Worcester.

	Base per 100 lb
Annealed fence wire ....	\$3.95† \$4.96
Annealed galv. fence wire .....	4.40† 5.41

†10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column
Woven wire fence* .....	84 107
Fence posts, carloads....	90††
Single loop bale ties ..	86 110
Galvanized barbed wire**	94 114
Twisted barbed wire ..	94

\* 15½ gage and heavier. \*\* On 80-rod spools in carload quantities. †† Pittsburgh, Duluth.

## HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldcor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	Y-50	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois, Republic	Repub-lic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	American Rolling Mill	Great Lakes Steel
Plates.....	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	....	4.10
Sheets	Hot-rolled...	3.85	3.85	3.85	3.85	3.85	3.85	3.85	....	3.75
	Cold-rolled...	4.75	4.75	4.75	....	4.75	4.75	4.75	5.225*	4.55
	Galvanized...	....	5.40	....	....	5.40	....	....	....	....
Strip	Hot-rolled...	3.85	3.85	3.85	....	3.85	3.85	3.85	....	3.75
	Cold-rolled...	....	....	4.75	....	4.75	4.75	4.75	5.00*	4.55†
Shapes.....	....	3.85	....	....	3.85	3.85	3.85	3.85	....	....
Beams.....	....	3.85	....	....	....	3.85	....	....	....	....
Bars	Hot-rolled...	4.00	4.00	4.00	....	4.00	4.00	4.00	....	4.00
	Cold-rolled...	....	....	....	....	....	....	4.60	....	....
Bar shapes.....	....	4.00	....	....	4.00	4.00	4.00	4.00	....	....

\* 21 gage and lighter. † Pittsburgh, add 0.10¢ at Chicago and Gary.

# PRICES

## PIPE AND TUBING

Base discounts. F.o.b. Pittsburgh and Lorain, steel butt weld and seamless. Others f.o.b. Pittsburgh only

Base price, \$200.00 per net ton

### Standard, threaded & coupled

Steel, butt weld	Black	Galv.
1/2 in. ....	55 1/2	41
3/4 in. ....	58 1/2	45
1 to 3-in. ....	60 1/2	47 1/2
Wrought Iron, butt weld		
1/2 in. ....	2	+20
3/4 in. ....	11 1/2	+10
1 and 1 1/2 in. ....	17	+2
1 1/2 in. ....	22 1/2	1 1/2
2 in. ....	23	2

Steel, lap weld		
2 in. ....	53	39 1/2
2 1/2 and 3 in. ....	56	42 1/2
3 1/2 to 6 in. ....	58	44 1/2

Steel, seamless		
2 in. ....	52	38 1/2
2 1/2 and 3 in. ....	55	41
3 1/2 to 6 in. ....	57	43 1/2

Wrought Iron, lap weld		
2 in. ....	14 1/2	+5 1/2
2 1/2 to 3 1/2 in. ....	17	+1 1/2
4 in. ....	21	4
4 1/2 to 8 in. ....	19	2 1/2

### Extra Strong, plain ends

Steel, butt weld		
1/2 in. ....	54 1/2	41 1/2
3/4 in. ....	58 1/2	45 1/2
1 to 3 in. ....	60	48

Wrought Iron, butt weld		
1/2 in. ....	6 1/2	+14
3/4 in. ....	12 1/2	+8
1 to 2 in. ....	22	2

Steel, lap weld		
2 in. ....	52	39 1/2
2 1/2 and 3 in. ....	56	43 1/2
3 1/2 to 6 in. ....	59 1/2	47

Steel, seamless		
2 in. ....	51	38 1/2
2 1/2 and 3 in. ....	55	42 1/2
3 1/2 to 6 in. ....	58 1/2	46

Wrought Iron, lap weld		
2 in. ....	17 1/2	+2
2 1/2 to 4 in. ....	26	8 1/2
4 1/2 to 6 in. ....	22	4

Basing discounts for standard pipe are for threads and couplings. For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt weld. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

## BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, out length 4 to 24 ft, inclusive.

O.D. Gage	Seamless	Electric Weld
	Hot- Rolled	Cold- Rolled
2 in. BWG	15.29	18.17
2 1/2	20.57	24.43
3	22.87	27.18
3 1/2	28.86	34.30
4	35.82	42.55

## CAST IRON WATER PIPE

6-in. to 24-in. del'd Chicago	Per net ton
6-in. to 24-in. del'd New York	\$81.56
6-in. to 24-in., Birmingham	79.80
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	71.00
Class "A" and gas pipe, \$5 extra: 4-in. pipe is \$5 a ton above 6-in.	95.00

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

### Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
1/2 in. & smaller x 6 in. & shorter	55
9/16 & 5/8 in. x 6 in. & shorter	52
3/4 in. x 6 in. & shorter	49
1 1/2 in. and larger, all lengths	48
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Plow bolts	57

### Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller	48
9/16 to 1 in. inclusive	47
1 1/4 to 1 1/2 in. inclusive	45
1 1/2 in. and larger	44

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

### Semifin. Hexagon Nuts

Base discount less case lots

	U.S.S.	S.A.E.
7/16 in. and smaller	51	
1/2 in. and smaller	48	
1/2 in. through 1 in.	48	
9/16 in. through 1 in.	47	
1 1/4 in. through 1 1/2 in.	45	46
1 1/2 in. and larger	44	

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

### Stove Bolts

Consumer

Packages, nuts separate	60 and 10
In bulk	74

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

### Large Rivets

(1/2 in. and larger)

Base per 100 Lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$5.25
F.o.b. Lebanon, Pa.	5.40

### Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55 and 5

### Cap and Set Screws

(In packages)

Percent Off List

	Consumer
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	56
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Fillister head cap, listed sizes	40

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

## FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF <sub>2</sub> Content:	Base price per short ton
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

## LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.95
Old range, non-bessemer	5.80
Mesabi, bessemer	5.70
Mesabi, non-bessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947.

## METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	23¢ to 27¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31 1/2¢
Copper, reduced, 150 and 200 mesh	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe	11¢ to 16¢
Swedish sponge iron, 100 mesh, c.l.f.	
N. Y., carlots, ocean bags	7.4¢ to 8¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	66¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	25¢ to 31¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	.90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	\$2.00
Chromium, 100 mesh and finer	\$1.025
Lead, 100, 200 & 300 mesh, 18.50¢ and Manganese, minus 325 mesh and coarser	33¢
Nickel, 150 mesh	51 1/2¢
Silicon, 100 mesh	18.15¢
Solder powder, 100 mesh, 8 1/2¢ plus metal	
Tin, 100 mesh	86.75¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	\$2.80
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	\$2.65
Under 100 lb	\$2.90

## COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$8.75 to \$9.25
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	10.00 to 10.50

### Peandry, Byproduct

Chicago, del'd	\$16.10
Chicago, f.o.b.	15.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	15.35
Philadelphia, del'd	18.46
Buffalo, del'd	16.14
Ashland, Ohio, f.o.b.	13.35
Painesville, Ohio, f.o.b.	14.60
Erie, del'd	15.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	15.85
Birmingham, del'd	12.35

## REFRACTORIES

(F.o.b. Works)

### Fire Clay Brick

Carloads, Per 1000

First quality, Ohio	\$57.00
First quality, Pa., Md., Ky., Mo.	65.00
First quality, New Jersey	70.00
Sec. quality, Pa., Md., Ky., Mo.	59.00
Sec. quality, New Jersey	62.00
Sec. quality, Ohio	51.00
Ground fire clay, net ton, bulk	9.50

### Silica Brick

Pennsylvania and Birmingham	\$65.00
Chicago District	74.00
Silica cement, net ton (Eastern)	11.50
Chicago	12.50

### Chrome Brick

Per Net Ton

Standard chemically bonded, Balt.	
Plymouth Meeting, Chester	\$59.00

### Magnesite Brick

Standard, Balt. and Chester	\$81.00
Chemically bonded, Baltimore	70.00

### Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks	\$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, O.	10.55
Midwest, add 10¢; Mo. Valley, add	



PRICES

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		Plates	Standard Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled (10 gage)	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia.....	\$4.24	\$5.18	\$5.29	\$4.43	\$5.28	\$4.54	\$4.22	\$4.48	\$5.38	\$8.37	\$8.37	\$9.88	\$9.88
New York.....	4.42	5.17 <sup>1</sup>	5.47	4.62	5.40	4.72	4.37	4.62	5.42	8.42	8.42	9.92	9.92
Boston.....	4.50	5.12 <sup>1</sup>	5.55 <sup>1</sup>	4.65	5.38	4.80	4.47	4.62	5.46	8.62	8.62	9.97	9.97
Baltimore.....	4.09	.....	5.14	4.40	.....	4.39	4.34	4.45	5.35	.....	.....	.....	.....
Norfolk.....	4.35	.....	.....	.....	.....	4.50	4.50	4.75	5.50	.....	.....	.....	.....
Chicago.....	3.85	.....	.....	4.05	.....	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Milwaukee.....	4.199	4.799	5.249	4.199	.....	4.499	4.249	4.249	5.149	8.399	8.399	9.649	9.649
Cleveland.....	4.00	4.60	5.238	4.188	.....	4.30 <sup>†</sup>	4.311	4.05	4.95	8.358	8.358	9.35	9.35
Buffalo.....	4.00	4.60	5.35	4.30	5.25	4.65	4.05	4.05	4.95	8.10	8.10	9.35	9.35
Detroit.....	4.15	4.75	5.42	4.34	5.24	4.59 <sup>†</sup>	4.42	4.20	5.12	8.51	8.51	9.74	9.74
Cincinnati.....	4.116	4.716	5.166	.....	.....	4.803	4.444	4.403	5.303	.....	.....	.....	.....
St. Louis.....	4.199	4.799	5.424	4.199	5.424	4.499	4.249	4.249	5.324	8.574	8.574	9.824	9.824
Pittsburgh.....	4.00	4.60 <sup>1</sup>	5.05	4.00	4.95	4.30	4.05	4.05	4.95	8.10	8.10	9.35	9.35
St. Paul.....	4.384 <sup>7</sup>	5.034 <sup>1</sup>	5.434 <sup>2</sup>	4.404 <sup>7</sup>	.....	4.684 <sup>7</sup>	4.434 <sup>7</sup>	4.434 <sup>7</sup>	5.726 <sup>8</sup>	.....	10.084 <sup>6</sup>	.....	11.726 <sup>6</sup>
Duluth.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Omaha.....	4.868	6.618 <sup>1</sup>	5.918	4.868	.....	5.168	4.918	4.918	5.818	.....	.....	.....	.....
Indianapolis.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Birmingham.....	3.85 <sup>11</sup>	.....	5.20	4.00 <sup>11</sup>	.....	4.30 <sup>11</sup>	4.05 <sup>11</sup>	4.05 <sup>11</sup>	5.83	.....	.....	.....	.....
Memphis.....	4.47	.....	5.97	4.72	.....	4.92	4.67	4.67	5.78	.....	.....	.....	.....
New Orleans.....	*4.46 <sup>11</sup>	5.77 <sup>1</sup>	.....	.....	.....	4.83 <sup>11</sup>	*4.68 <sup>11</sup>	*4.78 <sup>11</sup>	6.14	.....	.....	.....	.....
Los Angeles.....	5.35	7.00 <sup>1</sup>	6.70	5.65	8.35 <sup>5</sup>	5.20 <sup>12</sup>	5.20 <sup>12</sup>	5.10 <sup>13</sup>	6.90 <sup>14</sup>	9.65 <sup>10</sup>	9.35	11.05	11.05
San Francisco.....	4.90 <sup>8</sup>	6.30 <sup>9</sup>	6.45	5.20 <sup>8</sup>	.....	5.00 <sup>8</sup>	4.90 <sup>8</sup>	4.75 <sup>8</sup>	7.00 <sup>10</sup>	.....	.....	.....	.....
Seattle.....	5.00	7.80	6.30	5.30 <sup>4</sup>	.....	5.25 <sup>4</sup>	4.95 <sup>4</sup>	5.00 <sup>4</sup>	7.10	.....	.....	.....	.....
Portland.....	5.00 <sup>3</sup>	.....	6.25 <sup>9</sup>	5.50 <sup>3</sup>	.....	5.40 <sup>3</sup>	5.10 <sup>3</sup>	5.10 <sup>3</sup>	7.20	.....	9.30	.....	.....
Salt Lake City.....	6.25	.....	7.71	6.50	.....	6.10	6.25	6.25	7.50 <sup>10</sup>	.....	.....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 lb and over.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 499 lb; (4) 300 to 10,000 lb; (5) 2000 lb and over; (6) 1000 lb

and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 3749; (13) 400 to 1999; (14) 1500 and over.

\* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	34.00	34.50	35.00	35.50	.....	Boston.....	Everett.....	\$0.50 Arb.	29.50	30.00	30.50	31.00	.....
Birdsboro.....	34.00	34.50	35.00	35.50	39.00	Boston.....	Birdsboro-Steelton.....	4.82	.....	.....	.....	.....	43.82
Birmingham.....	29.38	29.88	.....	.....	.....	Brooklyn.....	Bethlehem.....	3.00	37.00	37.50	38.00	38.50	.....
Buffale.....	32.50	33.00	33.50	.....	.....	Brooklyn.....	Birdsboro.....	3.50	.....	.....	.....	.....	42.50
Chicago.....	32.50	33.00	33.50	34.00	.....	Cincinnati.....	Birmingham.....	4.87	34.25	34.75	.....	.....	.....
Cleveland.....	32.50	33.00	33.50	.....	.....	Cincinnati.....	Bethlehem.....	1.84	35.84	36.34	36.84	37.34	.....
Duluth.....	33.00	33.50	34.00	34.50	.....	Jersey City.....	Birdsboro.....	2.33	.....	.....	.....	.....	41.33
Erie.....	32.50	33.00	33.50	34.00	.....	Los Angeles.....	Provo.....	5.94	38.94	39.44	.....	.....	.....
Everett.....	29.00	29.50	30.00	30.50	.....	Mansfield.....	Cleveland-Toledo.....	2.33	34.83	35.33	35.83	36.33	.....
Granite City.....	32.50	33.00	33.50	.....	.....	Philadelphia.....	Swedeland.....	1.01	36.01	36.51	37.01	37.51	.....
Neville Island.....	33.00	33.50	33.50	34.00	.....	Philadelphia.....	Birdsboro.....	1.49	.....	.....	.....	.....	40.49
Provo.....	33.00	33.50	.....	.....	.....	San Francisco.....	Provo.....	5.94	38.94	39.44	.....	.....	.....
Sharpsville.....	33.00	33.50	33.50	34.00	.....	Seattle.....	Provo.....	5.94	38.94	39.44	.....	.....	.....
Steelton.....	34.00	.....	.....	.....	39.00	St. Louis.....	Granite City.....	0.75 Arb.	33.25	34.25	34.25	.....	.....
Swedeland.....	37.50	35.50	36.00	36.50	.....								
Toledo.....	32.50	33.00	33.50	34.00	.....								
Troy, N. Y.....	34.00	34.50	35.00	35.50	39.00								
Youngstown <sup>1</sup> .....	32.50	33.00	33.00	33.50	.....								

(1) Struthers Iron & Steel Co., Struthers, Ohio, charges 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base price for low phosphorous \$40.50 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, \$45.99. High phosphorous charcoal pig iron is not being produced.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5

to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$40.50; f.o.b. Buffalo—\$41.75. Add \$1.00 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.  
 Carload lots (bulk) ..... \$135.00  
 Less ton lots (packed) ..... 148.50  
 F.o.b. Pittsburgh ..... 139.50  
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.  
 Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.  
 Eastern Central Western  
 Carload, bulk .. 6.40 6.65 7.20  
 Ton lots ..... 7.30 7.90 9.80  
 Less ton lots .. 7.70 8.30 10.20

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.  
 16-19% Mn 19-21% Mn  
 3% max. Si 3% max. Si  
 Carloads ..... \$43.00 \$44.00  
 F.o.b. Pittsburgh 47.00 48.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.  
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.  
 Carload, bulk ..... 30  
 L.c.l. lots ..... 33

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
 Carloads ..... 32  
 Ton lots ..... 34  
 Less ton lots ..... 36

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.  
 Carloads Ton Less  
 0.10% max. C, 0.06% ..... 21.00 21.40 21.65  
 0.10% max. C ..... 20.50 20.90 21.15  
 0.15% max. C ..... 20.00 20.40 20.65  
 0.30% max. C ..... 19.50 19.90 20.15  
 0.50% max. C ..... 19.00 19.40 19.65  
 0.75% max. C ..... 18.50 18.90 19.15  
 7.00% max. Si ..... 16.00 16.40 16.65

## Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.  
 Carload, bulk ..... 6.45  
 Ton lots ..... 7.40  
 Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet ..... 6.15  
 Ton lots ..... 7.05  
 Less ton lots ..... 7.45

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$56.00 f.o.b. Keokuk, Iowa; \$52.75 f.o.b. Jackson, Ohio; \$54.00 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.  
 Eastern Central Western  
 96% Si, 2% Fe.. 14.65 16.90 18.65  
 97% Si, 1% Fe.. 15.05 17.30 19.05

## Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb briquets.  
 Eastern Central Western  
 Carload, bulk .. 3.85 4.10 4.30  
 Ton lots ..... 4.75 5.35 5.65  
 Less ton lots .. 5.15 5.75 6.05

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 25% Si .....11.65 ..... 7.95 8.15  
 50% Si ..... 7.45 ..... 5.35 5.65  
 75% Si ..... 9.25 ..... 10.30 11.50  
 80-90% Si .....10.45 ..... 12.35 13.05  
 90-95% Si .....12.05 ..... 13.05

## Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 0.06% C ..... 23.00 23.40 24.00  
 0.10% C ..... 22.50 22.90 23.50  
 0.15% C ..... 22.00 22.40 23.00  
 0.20% C ..... 21.50 21.90 22.50  
 0.50% C ..... 21.00 21.40 22.00  
 1.00% C ..... 20.50 20.90 21.50  
 2.00% C ..... 19.50 19.90 20.50  
 65-69% Cr, 4-9% C ..... 15.60 16.00 16.15  
 62-66% Cr, 4-6% C ..... 16.60 17.00 17.15  
 Briquets — contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.  
 Eastern Central Western  
 Carload, bulk.. 9.85 10.10 10.20  
 Ton lots ..... 10.75 11.65 12.25  
 Less ton lots .. 11.15 12.05 12.65

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

## S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.  
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.  
 Eastern Central Western  
 Carload ..... 16.70 17.10 17.25  
 Ton lots ..... 17.90 19.20 20.00  
 Less ton lots .. 18.60 19.90 20.70  
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.  
 Eastern Central Western  
 Carload ..... 20.00 20.40 21.00  
 Ton lots ..... 21.00 21.65 22.85  
 Less ton lots .. 22.00 22.65 23.85

## Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.  
 Eastern Central Western  
 0.20% max. C.. 83.50 85.00 86.25  
 0.50% max. C.. 79.50 81.00 82.25  
 9.00% min. C.. 79.50 81.00 82.25

## Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60.65% Si, 6.00% max. Fe.  
 Eastern Central Western  
 Carloads ..... 13.00 13.50 15.55  
 Ton lots ..... 14.50 15.25 17.40  
 Less ton lots .. 15.50 16.25 18.40

## Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 16-20% Ca, 14-18% Mn, 53-59% Si.  
 Eastern Central Western  
 Carloads ..... 15.50 16.00 18.05  
 Ton lots ..... 16.50 17.35 19.10  
 Less ton lots .. 17.00 17.85 19.60

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.  
 Cast Turnings Distilled  
 Ton lots ..... \$1.60 \$2.35 \$2.95  
 Less ton lots .. 1.95 2.70 3.75

## CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.  
 Eastern Central Western  
 Ton lots ..... 13.50 14.60 16.55  
 Less ton lots .. 14.25 15.35 17.30  
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.  
 Eastern Central Western  
 Ton lots ..... 13.25 14.35 16.30  
 Less ton lots .. 14.00 15.10 17.05

## SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.  
 Eastern Central Western  
 Ton lots ..... 13.25 14.35 16.30  
 Less ton lots .. 14.00 15.10 17.05

## Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant  
 Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed... \$2.00  
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.  
 Openhearth ..... \$2.70  
 Crucible ..... \$2.80  
 High speed steel (Primos)... \$2.90  
 Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub> technical grade, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> ..... \$1.10  
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb  
 Ton lots ..... \$2.50  
 Less ton lots ..... \$2.55  
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo ..... 95¢  
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo ..... 80¢  
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo ..... 80¢  
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo ..... 80¢  
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti ..... \$1.23  
 Less ton lots ..... \$1.25  
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti ..... \$1.35  
 Less ton lots ..... \$1.40  
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton.. \$142.50  
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$65.00  
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.  
 Carload, lots ..... 14.50¢  
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy  
 Carload, bulk ..... 4.85¢  
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload ..... 6.25¢  
 Ton lots ..... 6.75¢  
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots ..... 9.00¢  
 Ton lots ..... 9.75¢  
**Boron Agents**  
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.  
 Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.  
 Eastern Central Western  
 Less ton lots .. \$1.30 \$1.3075 \$1.329  
 Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.  
 Ton lots ..... \$1.89 \$1.903 \$1.935  
 Less ton lots 2.01 2.023 2.055  
 Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.  
 Less ton lots.. \$2.10 \$2.1125 \$2.1445  
 Silcaz, contract basis, f.o.b. plant freight allowed, per pound.  
 Carload lots ..... 35¢  
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.  
 No. 1 ..... 87.5¢  
 No. 6 ..... 60¢  
 No. 79 ..... 45¢  
 Bortram, f.o.b. Niagara Falls  
 Ton lots, per pound ..... 45¢  
 Less ton lots, per pound..... 50¢  
 Carbortam, f.o.b., Suspension Bridge, N.Y., freight allowed.  
 Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.  
 Ton lots, per pound ..... 8.0¢



## Westinghouse Plans To Coordinate Activities For Atomic Research

Pittsburgh

••• Coordination of the research, engineering and manufacturing activities of the Westinghouse Electric Corp. in a broad program to hasten such applications of atomic energy as ship propulsion and generation of electricity is disclosed in the company's annual report to stockholders.

Only technical difficulties remain to be overcome before we can use atomic energy as a source of power, according to Dr. Hutcheson, associate director of the Westinghouse research laboratories. For the foreseeable future atomic energy will be used as a new kind of fuel to generate steam, but there is a good chance that some day we may be able to discard the turbines and boilers now used and get electric power directly from radioactive byproducts of a pile. Such things are years away—but today they present a challenge to the nuclear scientist.

In addition to atomic energy, numerous other research and engineering projects were undertaken in 1946, the company reports, including development and production of equipment for a new assault on the factors which limit high voltage, long distance power transmission. Nearing completion at Brilliant, Ohio, on the property of the American Gas & Electric Service Corp., are two lines each a mile long for which Westinghouse provided the transformers, lightning arresters and metering equipment. These lines were built for experimental operation at voltages as high as 500,000 to determine the next step beyond the present 287,000 v transmission now in commercial service.

Paralleling this work was the development of new types of gas turbines and jet engines for aircraft, new industrial applications for gas turbines, the development of a 2000-hp gas turbine-electric drive for locomotives, and design of a high efficiency steam turbine, now being built in south Philadelphia.

Research in the field of insulation has been rewarded by the

production of a new type of enamel coating as an insulating material for copper wire such as is used in motors and transformers. At this time the material has been developed to the point that it is satisfactory for use on the smaller wires. Research efforts are now being expanded on this material so that soon it may be applied to all sizes of wire which the company uses.

Westinghouse output, as represented by net sales billed, totaled \$301,691,788, a new peacetime high, compared with \$685,132,854 in 1945.

The demand for industrial motors is expected to total more than 6 million during the next 5 year period. Westinghouse is planning production on a basis 80 pct higher than in the years of 1937-39, and 50 pct above the peak peacetime year of 1940.

The company reports considerable progress was made last year on a \$132 million expansion and rearrangement program, which so far has added 3 million sq ft of space to the company's manufacturing facilities. The report pointed out that approximately \$60 million has already been spent

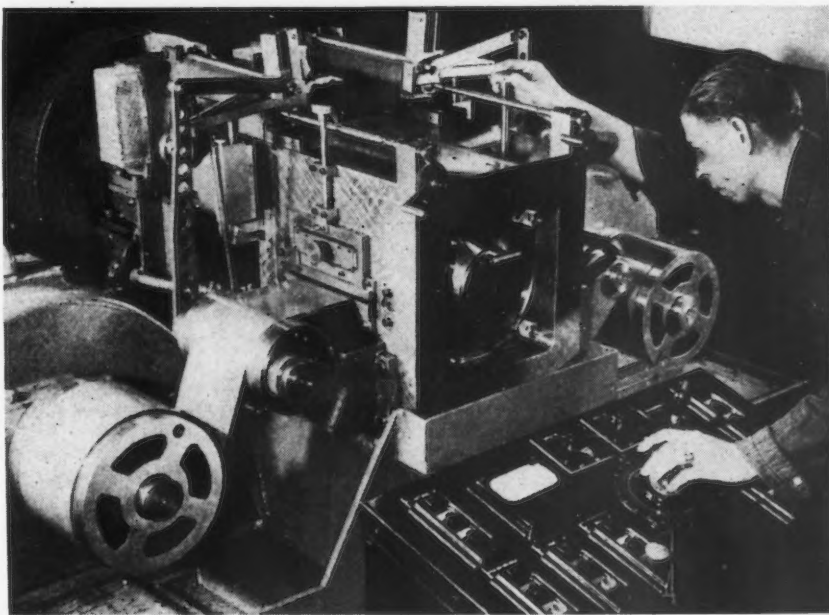
on this program. New plants have been purchased in Buffalo, N. Y., and Beaver, Pa., and the site for a lamp manufacturing plant has been purchased at Little Rock, Ark. Whole divisions have been relocated and many others are being enlarged and equipped with new machines and facilities.

The company's statement of consolidated income and surplus showed an operating loss for 1946 of \$59,768,997, compared with operating profit of \$48,443,839 in 1945. However, net income for 1946 was \$8,823,846 equal to 68¢ a share on common stock, compared with a net income of \$26,744,055 or \$2.08 a share on common stock in 1945. This net income has been made possible only by the carry-back features of the federal tax laws.

Orders received during the year amounting to \$624,672,985 compared with \$778,318,097 in 1945. Unfilled orders at the end of 1946 totaled \$589,583,459 compared with \$303,873,749 at the end of 1945.

During the year the Company's employment hit a peacetime peak of 93,049 compared with average employment of 71,073 in 1941, the last peacetime year.

**MIDGET MILL:** Ralph Darby, operator of a research rolling mill at Westinghouse research laboratories, adjusts the strip tension on his mill. He is rolling Hiperco, a new highly magnetic alloy developed by Westinghouse engineers to reduce the size and weight of motors and generators for aircraft. Seven passes reduce a 1/40-in. strip to 0.002 in.



## France and Belgium Attempting to Eliminate Steel Subsidies

### Paris

• • • A general effort is being made in France and Belgium to eliminate the subsidies which are being paid to steel producers, and as a result price increases have recently been announced in both countries. The subsidies were granted during the low production periods of the postliberation period, to tide the firms over until raw material and fuel supplies became more adequate. There are conflicting views as to the urgency of today's need for continuing the subsidies. French sources in particular take a gloomy view of the ever increasing living costs, continued demands for higher wages and an uncertain coal supply picture.

The policies of both the governments in granting subsidies to keep steel selling prices low while reconversion was going on, despite strong inflationary movements in the economy, proved difficult to apply. At the end of 1946 the French government authorized an average increase of 20 pct on steel prices, but the increase was revoked 5 days later in order to conform with the nationwide 5 pct price cut ordered to break the inflationary spiral by Mr. Blum, the Premier.

At the time, it had been planned to drop the subsidies simultaneously with the increase, and

### French Grant Price Increases In Steel—But Will Deduct Portion of Sales Price

By JACK R. HIGHT  
European Editor

with the revocation it was agreed that the subsidy policy would be continued, and the matter of steel prices would be examined again in March. Coal subsidies were eliminated at the beginning of the year, and a price increase of 312 francs (\$2.60) per ton was allowed. Railway freight rates have also been increased, and to improve the plight of low-pay workmen a minimum wage level has been set which also tends to increase the industrial wage bill. Under this chain of circumstances some price concession to the steel industry became inevitable.

The actual increase is further complicated by the fact that the French Government, still gamely fighting inflation, is trying desperately to apply another 5 pct general price cut. Thus although the cut is being applied as generally as possible, it will not apply to steel. The average price increase, as already announced in

THE IRON AGE, amounts to 24 pct for steel and 36 pct for pig iron. The subsidies are being reduced, rather than eliminated, and the exact size is still under discussion.

The iron and steel industry is not the only one exempted from the second price cut. Due to a substantial amount of inflationary price movement in food during the war and postwar period, while industrial prices had been more rigidly controlled, the French price structure had been considerably distorted. Thus efforts are being made in applying the second price cut to eliminate a little of the most obvious distortion. Some balance is being attempted, until the conditions of a free market may be permitted when supplies are more generally available.

It has been calculated that if steel subsidies were to be completely eliminated that the steel producers would require price increases of about 48 pct, instead of the 24 pct which is being allowed at the present time. Basic arithmetic suggests that the subsidies bill for the industry, which amounted to 2.5 billion francs (\$20 million) for the first quarter will be cut in half as a result of the current increase.

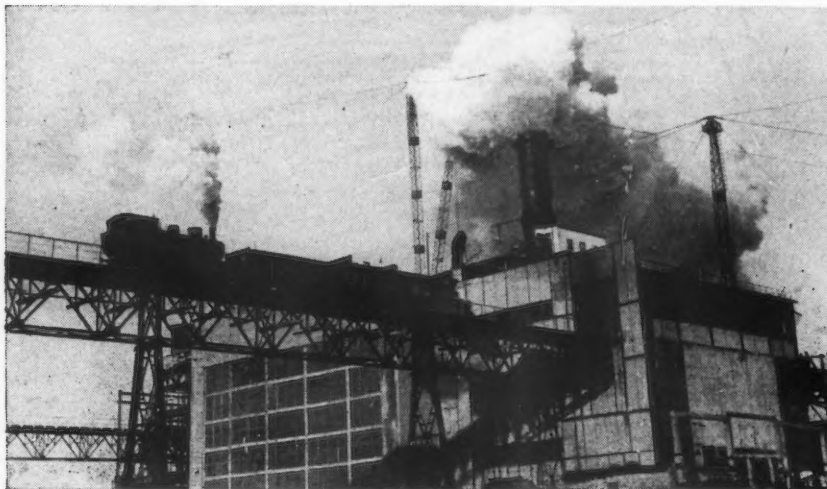
The 24 pct and 36 pct average increases on the steel and pig iron are differentiated according to the products, as follows:

Old prices    New prices  
Sept. 1, 1946    Mar. 1, 1947  
(per metric ton)

<b>Pig iron</b>		
Foundry phosphorus		
pig iron No. 3...	\$27.50	\$37.41
Hematite pig iron..	30.83	41.91
Foundry hematite..	31.25	42.50
<b>Half products (120 ton lots)</b>		
Rerolling (basic bessemer) .....	40.62	50.91
(openhearth) ....	44.89	54.58
<b>Finished products</b>		
Merchant bars (basic bessemer) .....	53.33	61.83
(openhearth) ....	58.33	71.25
Beams (basic bessemer) .....	51.57	63.92
(openhearth) ....	57.46	69.08
Strips, gas quality (basic bessemer) ..	58.05	72.83
(openhearth) ....	64.12	78.90
Plates (basic bessemer) .....	66.69	82.33
(openhearth) ....	71.50	87.50

(CONTINUED ON PAGE 132)

**PEAT BURNER:** The big electrical works at Dubrovsk in the USSR supply a large part of the surrounding area. A 50,000 kva generator has recently been installed in a rebuilding program following war damage. According to the caption furnished from Prague, the plant burns peat, which may account for the unusual character of the smoke.







## This Stainless Steel Collection does 89 mph!



**M**ANNED by a crew of four, this Olympic bobsled chassis has an estimated speed in excess of 89 mph. Note the ingenuity of design. The P-shaped hand rails serve as pushers, then swing in and lock to protect the crew. Instead of rope and drum, the sled is steered by standard auto gear. All parts are bolted for knockdown shipment.

The sled is built of 18-8 stainless steel throughout. Completely assembled, it includes round bars, hexagons, flats, sheets, tubing, pipe—even fittings. Yet every bit of stainless used was ob-

tained—overnight—from a nearby Frasse warehouse.

It pays, when you're working with stainless, to work from Frasse stocks. The wide range of sizes, shapes and analyses available from this single source is a time and effort saving convenience. Call or write for our latest inventory. *Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissabickon Avenue, Philadelphia 29, Pa. (Radcliff 5-7100) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore*

# FRASSE

for  
Stainless Steels

BARS • SHEETS  
PLATES • STRIP  
TUBES • PIPE  
ANGLES • WIRE



# MAKE 1947 PRODUCTS ON 1947 PRESSES

*Speed, power, streamlining, are the features that distinguish modern automobiles . . . and modern presses.*

Put the same efficiency into your production line that is engineered into your products . . . Designed for maximum utility, Danly presses have the mechanical accuracy and rugged construction that make for faster runs, more accurate stampings, longer die life, less downtime,

and greater production. Enclosed construction saves floor space, lessens safety hazards—especially in rows or batteries.

Bring your production equipment in step with the products you manufacture. Make 1947 Products on 1947 Presses.



## **STEEL UNIT FRAMES**

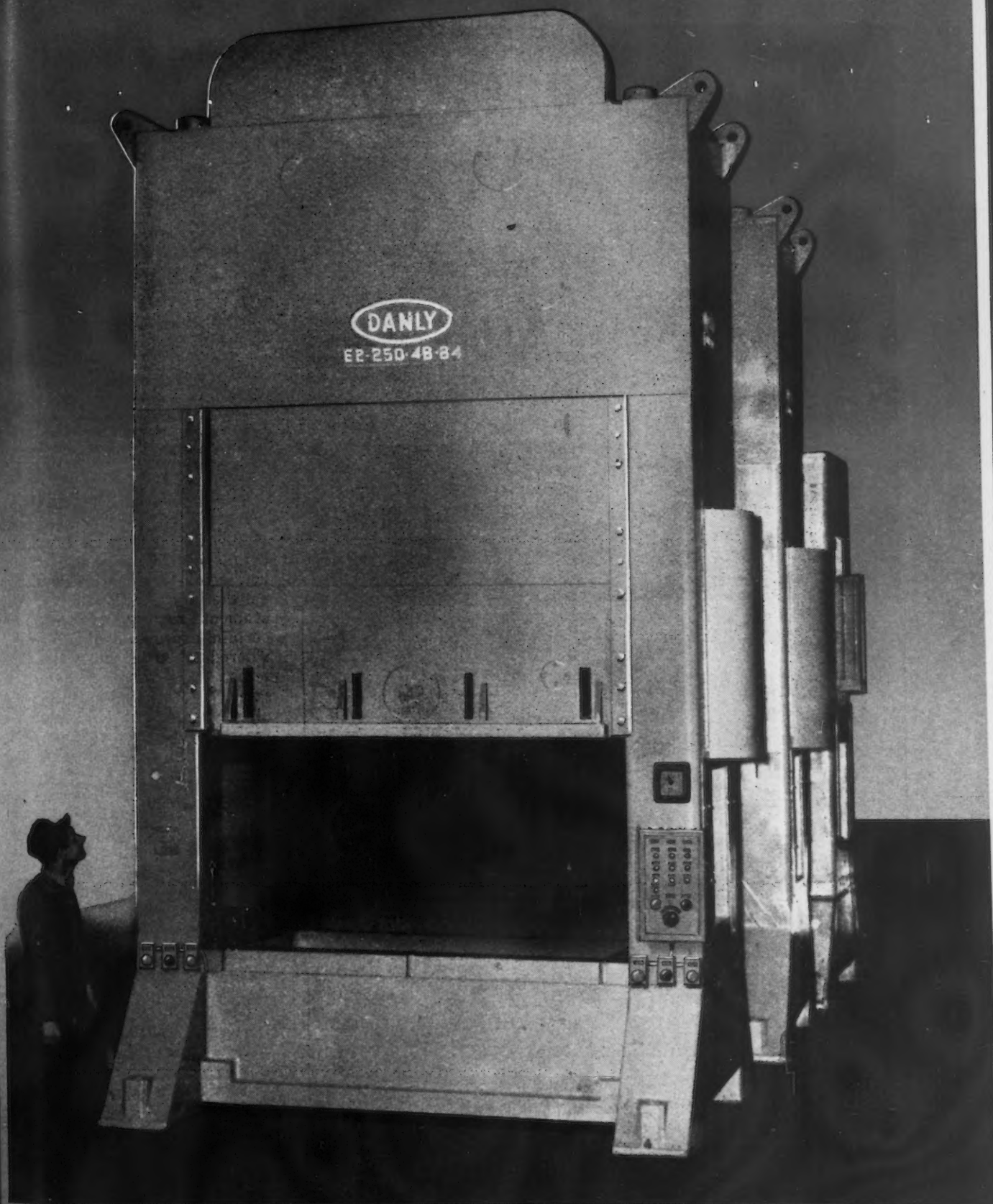
Danly Open Back Inclined and Horning presses have unit frames of rugged one-piece all-steel construction. The frames, massive for presses of this type and size, lend great rigidity and resistance to deflection to these presses. Gears and driving members completely enclosed within the frame run in a spray of filtered oil.

Unusually long gibbing and two slide connections make for even pressure along the full length of the stroke—insure accurate alignment on large or progressive dies—prevent eventual loosening up or slide play due to uneven loads.

Danly O.B.I. and Horning presses range from 50 to 200 tons pressure in both single and two-point models.

**DANLY**  
The Press  
for  
Modern  
Production





These double geared presses are typical of Danly's complete line of one, two and four point straight-side presses. Pressures range from 100 tons up. Special sizes and types engineered to specifications.

**DANLY MACHINE SPECIALTIES, INC.**  
**2100 South 52nd Avenue**  
**Chicago 50, Illinois**

# WHY WASTE FUEL?



## Therm-O-flake *prevents waste* BY REDUCING HEAT LOSSES...

MORE THAN 25% of Open Hearth fuel can be wasted through heat lost through brickwork and heat absorbed by cold infiltrated air.

**Therm-O-flake** INSULATIONS are designed to reduce heat losses and seal furnace walls against cold air infiltration. These are used regularly on hundreds of open hearth furnaces and save steel producers thousands of fuel dollars daily.

**Therm-O-flake** ENGINEERS will prepare an accurate fuel economy survey of existing furnaces in your plant and submit complete thermal data and recommendations for safe maximum insulation of any open hearth furnace, on request.



JOLIET, ILLINOIS

Exclusive Manufacturers of  
**Therm-O-flake**  
open hearth insulation

## NEWS OF INDUSTRY

(CONTINUED FROM PAGE 128)

	Old prices Sept. 1, 1946	New prices Mar. 1, 1947 (per metric ton)
Sheets (basic bessemer) .....	72.08	90.33
(openhearth) ....	78.19	95.91
Thin sheets (basic bessemer) .....	79.93	105.25
(openhearth) ....	85.30	153.91
Wire rods (basic bessemer) .....	63.37	77.91
(openhearth) ....	67.48	82.75
Light rails (basic bessemer) .....	50.41	63.16
Heavy rails (basic bessemer) .....	65.69	82.33
Galvanized sheets..	112.15	153.91
Black sheets .....	139.41	184.16
Tinplate .....	184.55	236.50

Base prices, per metric ton, carloads, production tax suspended, transaction tax included, ab works, excepted phosphorus pig iron (base Longwy), black sheets and tinplate are delivered to railway station.

The order issued by the Ministry of Industrial production establishing the new prices furnishes details on how payment is effected in the industry. In order to compel the industry to adhere to government regulations and incur certain expenses which are considered to be in the national interest, it is provided that a certain portion of the sales price of all products will be diverted to special funds used to finance apprenticeship, research and technical amortization.

On the price of pig iron a sum of 34 francs (28¢) will be deducted and devoted to an apprenticeship and education fund, to finance training centers for workmen, foremen, engineers and officers. This fund is to be administered according to the instructions of the government's Iron and Steel Board.

Another sum of 34 francs is to be paid into a fund for financing research in the iron and steel industry, and a central research body is being set up to carry on and direct this work. The government body will also control the research program.

Another sum of 300 francs (\$2.50) per ton is to be blocked on the books of the central organization which sells iron and steel products (Comptoir des Produits Siderurgiques), and is intended for amortization of the plants. This fund will be paid out only if the individual firms follow the instructions of the government for modernization and extension of their works. A total of 368 francs (\$3.06) per ton of



pig iron is being diverted, and by this means the government is using the central trade associations to develop a powerful weapon in favor of government ideas.

Such sums are also being diverted from steel selling prices, as well as pig iron. From steel product receipts the apprenticeship fund draws 45 francs (37¢) per ton and research a similar amount. The amount blocked for amortization varies according to the type of plant, and also according to whether the material is produced by an integrated works or by a reroller. The following table shows the total amount in francs deducted from the most important products:

	Steel Producers		
	Basic	Open-	
	Bessemer	hearth	Rerollers
Ingot	370*	170*	....
Half products	555	310	....
Beams	765	455	250*
Merchant bars	850	590	245
Wire rod, strip, skelp	965	675	280
Plates	775	470	165
Sheets	965	675	245
Thin sheets and black sheets	1235	890	470
Galvanized sheets	1520	....	115
Tinplate	1405	1405	220

\* In Francs.

Special powers are given to the steel industry employers' association by the order to "make special payments between works where the rate of production or conditions of supply of which have been to different owing to circumstances independent of the will of the managers or the capacity of the works."

A similar compensation is authorized between works producing different products on which profit margins may vary greatly. The effect of these provisions will be that the trade association will tend to make the entire industry bear any cost inequalities brought about by shortages of raw materials, rather than having the losses fall on the unfortunate.

The French price increases will be partially borne by iron and steel consumers, but some allowances are being made in adjusting selling prices upward for certain industries. Those already announced include a 2 pct increase in automobile prices, 5 pct increase on bicycles, and 5 pct on typewriters. New orders will be issued shortly to fix the prices for the engineering industries. The

(CONTINUED ON PAGE 136)



"This Report," the Methods Engineer went on, "sets the facts down in black and white. With Cadmium so hard to get—"

"It says here," the Boss interrupted, "that Luster-on\* on zinc gives a bright, attractive surface that resists stains, fingermarks and white corrosion."

"That's right," said the M. E. "But from my standpoint the biggest appeal is the cost angle. Luster-on\* on zinc costs only about half as much as Cadmium."

"It means revising all your recommendations," the Boss reminded him.

"Exactly. But if plating zinc with Lus-

ter-on\* makes our product as good—or better—than it's ever been, I'd say that's a better bet than fighting for Cadmium and paying more for it when we do get it."

"That's good sense," the Boss said. "Get all the dope on Luster-on\* as soon as you can."

The Boss and his M. E. are talking about a Comprehensive Cost Analysis Report just prepared. In comparing the costs of Luster-on\* on zinc with Cadmium, this data reveals some startling facts. A copy will be sent you free by simply filling out and mailing the coupon.

Patent applied for.

**THE Chemical CORPORATION**

54 Waltham Ave., Springfield 9, Mass.

THE CHEMICAL CORPORATION  
54 Waltham Ave.,  
Springfield 9, Mass.

Please send us the Comprehensive  
Cost Analysis that compares the cost  
of Luster-on\* on zinc with Cadmium.

Name \_\_\_\_\_

Firm Name \_\_\_\_\_

Address \_\_\_\_\_

The Iron Age

April 17

## Strip Nickel faster and better with . . . STRIPODE!

Add STRIPODE to your regular Sulphuric Acid baths and watch things speed up! Nickel comes off more completely in less time—and you use less acid to boot! STRIPODE protects the base metal, prevents pitting and roughening, eliminates the need for polishing and severe buffing operations. Try STRIPODE—you'll get the best kind of job and save money besides.

S-18

THE CHEMICAL CORPORATION  
54 Waltham Ave.,  
Springfield 9, Mass.

Please send me full information  
and 1 gal. trial order of STRIPODE  
for better nickel stripping.

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

**THE CHEMICAL CORPORATION**  
54 Waltham Ave., Springfield 9, Massachusetts

# J&L STEEL



Otiscoloy enables this manufacturer to produce four trailers instead of three previously made with equivalent tonnage of ordinary steel

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON



## HI-TENSILE STEEL

Truck pay loads are increasing due to high-tensile steels, such as J&L Otiscoloy, which permit lighter design without sacrificing strength. Not only can a trucker haul more pay load, he also can keep under most state highway weight restrictions.

Railroads use Otiscoloy plates and Junior Beams in both freight and passenger cars. Its yield strength of 50,000 p.s.i. makes possible greater pay loads. Its resistance to abrasion and corrosion keeps cars out of repair shops and on the road longer.

Cargo holds of lake boats and river barges wear out quickly from abrasion of unloaders and corrosion of wet iron ore, coal and gravel. Otiscoloy is replacing ordinary structural steels for this service.

150-ft. smoke stack, 10 feet diameter at base, and 6 feet at top was made of J&L Otiscoloy. Superior strength of this high-tensile steel and its protection against atmospheric corrosion were factors in specifying Otiscoloy Steel for this stack of welded steel construction.

Furnace stoker worms of Otiscoloy have greater resistance to abrasion and corrosion, reduce maintenance costs.

Tough steel sides and tops of new motor coaches made of J&L High-Tensile Otiscoloy Steel provide greater strength to carry more passengers without adding dead-weight. Frames are also constructed of Otiscoloy sheets and plates formed into light, strong structural members and welded in place.

Deep-freeze & air conditioning units are readily formed of Otiscoloy sheets to resist corrosive action of moist air.

Shoe making equipment built of Otiscoloy is stronger, yet excellent weldability makes for easy fabrication.

25% reduction in weight is possible in dump trucks through use of Otiscoloy angles, channels and sheets for frames and body. Wear and tear from abrasion and corrosion are reduced. For these reasons Otiscoloy has also been used to advantage in mine cars, bins, chutes, cranes, power shovels, mowers, tanks, radiator brackets, advertising sign frames.

For assistance in selection and use of steels and steel products, contact nearest J&L District Sales Office listed at left or write: Publicity Manager, Jones & Laughlin Steel Corporation, Pittsburgh 30, Pa. From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in Otiscoloy and J alloy (high-tensile steels). Principal products: Hot Rolled & Cold Finished Bars and Shapes; Structural & Plates; Hot & Cold Rolled Strip & Sheets; Tubular, Wire & Tin Mill Products; Precisionbilt Wire Rope; Steel Barrels & Containers.

## FOR MORE PRODUCTION WITH LESS STEEL USE J&L OTISCOLOY

The extra strength of J&L Otiscoloy High-Tensile Steel makes possible the production of one-third more units per ton by reducing the amount of steel per unit 25%. This reduction in dead-weight has been used to advantage in designing transportation equipment, machinery and many other products. Some manufacturers are now making four truck trailers from 12 tons of Otiscoloy where formerly they could make only three from 12 tons of ordinary steel.

J&L Otiscoloy has other advantages. It resists abrasion and atmospheric corrosion. It can be welded and fabricated readily. These extra qualities afford equivalent service life and lower maintenance costs.

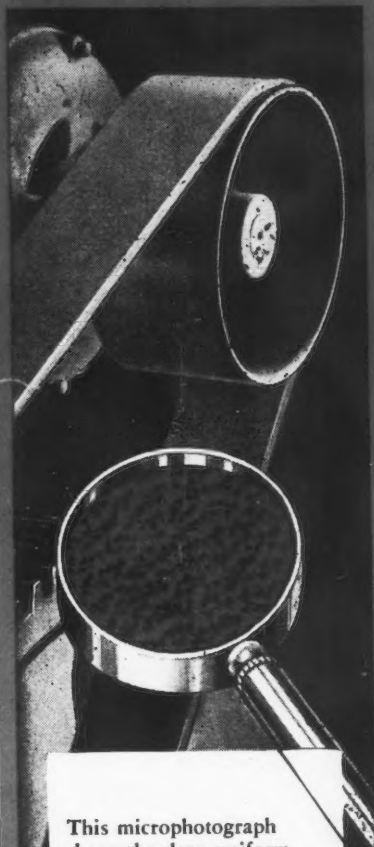
Otiscoloy High-Tensile Steel is produced in sheets, plates, bars, angles, Junior Beams, Channels and Tees. A booklet giving detailed information on the physical properties of these products is available. It may suggest how you can reduce your production costs, make a third more products with an equivalent tonnage of steel—and make them better. Write one of the sales offices listed below for copy.

### JONES & LAUGHLIN STEEL CORPORATION PITTSBURGH

SALES OFFICES: Atlanta • Baltimore • Boston • Buffalo • Chicago • Cincinnati • Cleveland  
Columbus • Dallas • Denver • Detroit • Harrisburg • Houston • Indianapolis • Los Angeles • Memphis  
Milwaukee • Minneapolis • New Haven • New Orleans • New York • N. Kansas City  
Philadelphia • Pittsburgh • St. Louis • San Francisco • Seattle • South Bend • Syracuse  
Toledo • Tulsa • Washington

CONTROLLED QUALITY STEELS

## HERE'S A CLOSE UP OF THIS BELT'S EXTRA PULLEY GRIP



This microphotograph shows the clean, uniform, open grain surface that gives Schieren DUXBAK leather belt extra pulley grip and greater drive-ability. Achieved by a special Schieren scouring process after tanning, this full-friction grip enables the belt to deliver extra RPM that helps step up machine output.

Low stretch, extra flexibility, and longer service life add to the money-saving advantages of DUXBAK belting. Write for further information.

SC-6

### CHAS. A. SCHIEREN COMPANY

LEATHER BELTINGS • SPECIALTIES  
HYDRAULIC PACKINGS

36 Ferry Street, New York 7, N. Y.  
60 Front Street, W., Toronto, Ont.  
Tanners and Manufacturers Since 1868

(CONTINUED FROM PAGE 133)  
question of increases for these companies are still under discussion with the government.

Discussion of possible Belgian steel price increases took place almost simultaneously with those in France. Provisory maximum prices had been established by the Belgian Government last August. The new prices have been delayed due to a violent political argument which has followed discussions for an increase in the price of coal. The new average Belgian coal price is 629 francs (\$14.29), compared with the old price of 46 francs (\$10.45). From this selling price a sum of 29 Belgian francs (66¢) will be deducted by the government for the financing of mechanization expenses in the coal mines. Metallurgical coke has been increased in price to 880 francs (\$20) and foundry coke to 980 francs (\$21.13).

The Belgian iron and steel industry has been granted a price increase considerably smaller than it had hoped. The price of merchant bars was provisionally fixed at 3150 francs (\$71.59) per metric ton last August was finally fixed at 2970 francs (\$67.04) for the period from Aug. 9, 1946, to Mar. 1, 1947, and now to 3150 francs (\$71.59) from Mar. 1 to June 30, when the price will again be reviewed. The decrease of 180 francs on the price for the period from August to March coming with the announcement of an increase in the coke price has raised considerable criticism from the Belgian industry. Producers are

appealing against the price decision, and intend to arrange for the matter to be arbitrated. It seems certain that one of the most important reasons that the government has not been too sympathetic to the demands of industry is the comfortable profit margin which the Belgians are enjoying on their export sales.

Looking at the prospect of reduced British exports of steel products this year, and the limited export steel shipments from America, the Belgians have taken advantage of the seller's market by increasing their prices for steel shipped to the Scandinavian countries by 100 francs (\$2.27) to 200 francs (\$4.54) per ton. This move brings the Belgian prices to those countries for merchant bars to 4100 francs (\$93.18) strip 4450 francs (\$101.13) and plates 4425 francs (\$100.56).

Argentinian buyers, who can offer few essential items for the Belgian economy in return for steel, must pay 5150 francs (\$117.04) for merchant bars. As previously mentioned, some observers are beginning to call attention to the complaints being heard from those who must pay such prices, and feel that they may not last much longer.

In Germany a program for a price increase to be coordinated with a reduction of subsidies has been submitted to the Allied Control Council by the Ruhr steel industry. The proposal specifies an increase of steel prices amounting to 54 Rm per ton (\$5.40 at the nominal rate).

NO HANDS: Because the young son of Mrs. Harriet Yarbrough, shown here, wanted a toy auto that would turn corners his father invented one that turns without a steering wheel merely by tilting the car body in the desired direction. He now assembles the cars in Chicago at the rate of 100 a day from prefabricated metal and plastic parts.



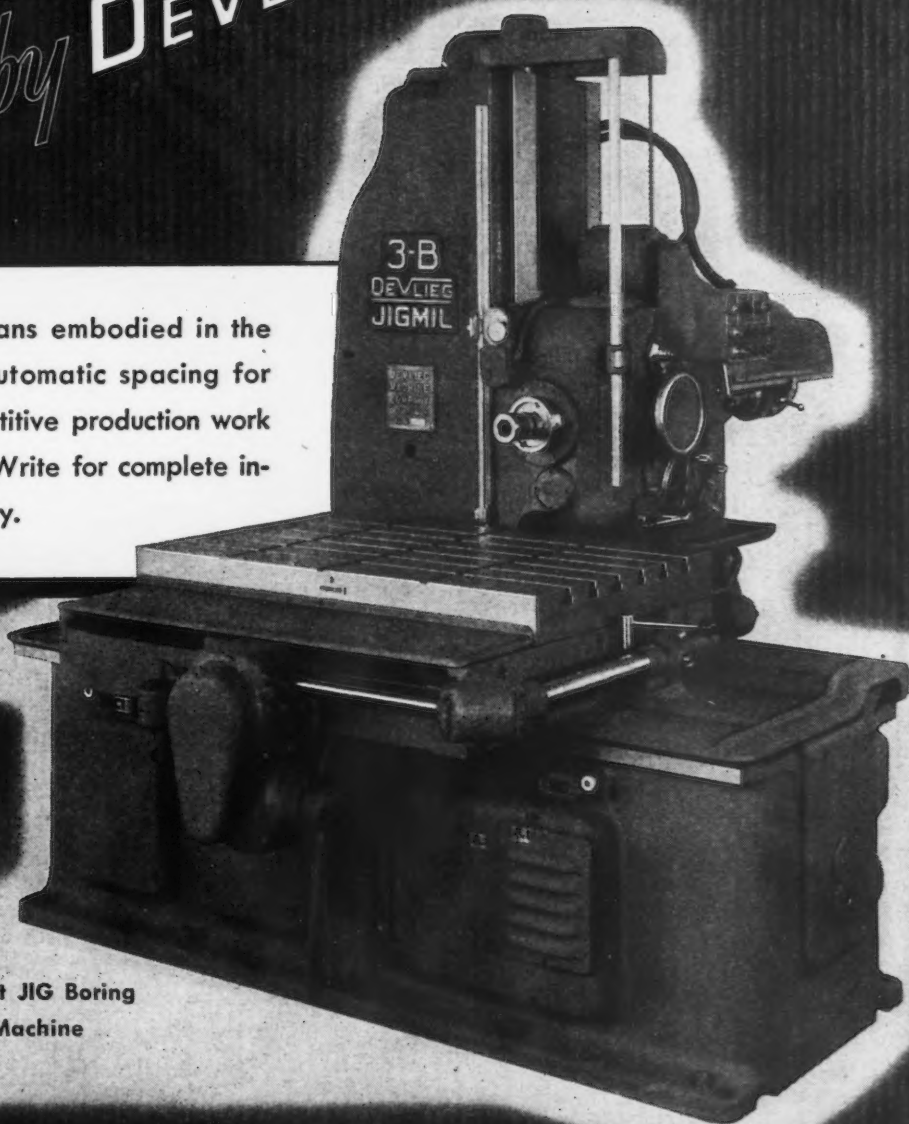


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## CPA Sees New Peak In First Quarter Output Of Building Materials

Washington

... New postwar highs in production of most building materials during the first quarter of 1947 have been forecast by CPA after tabulating preliminary figures for the period.

CPA said that for most of these materials the average monthly output estimated for the first quarter of 1947 is well above the 1946 monthly average.

At the same time, the Commerce Dept. announced that the gap between overall supply and demand is closing and that the picture is much more encouraging than a year ago. The Commerce production index for selected construction materials is 40 pct above a year ago.

At the beginning of 1946, the Commerce index showed that all materials recorded in the index except range boilers and unit heaters were at substantially higher levels than a year ago. Some materials—nails, tubs, sinks, warm air furnaces—were from double to triple the output of a year ago.

Outlook for cast iron soil pipe and plumbing fixtures was not as bright as the overall picture might indicate, however, since the production is not adequate to meet current requirements and still higher production is needed to rebuild inventories, the Department said. It warned that freight car shortages would likely curtail supplies during the first half of 1947.

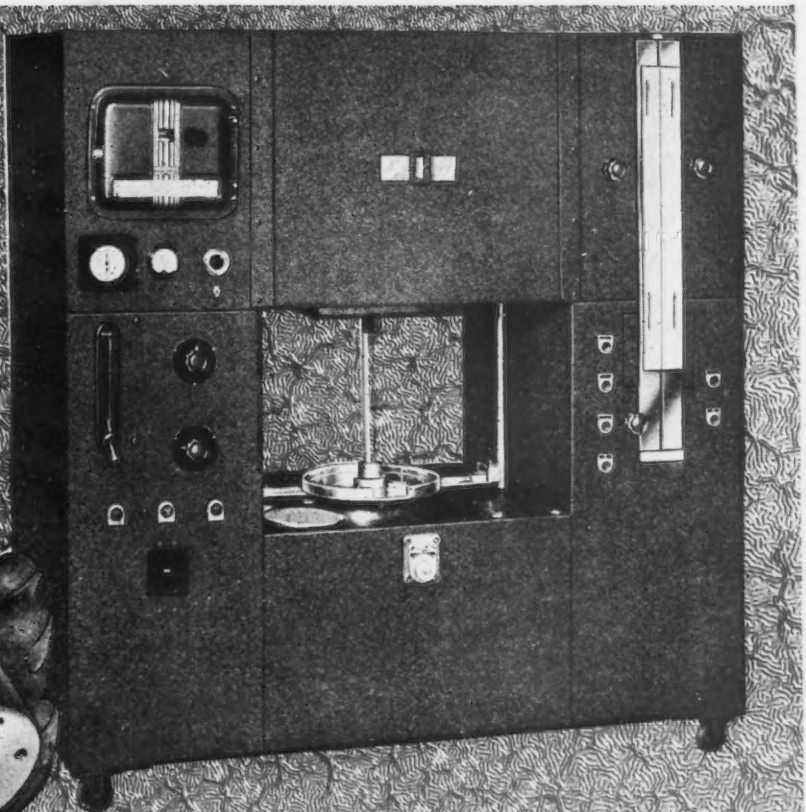
CPA'S preliminary estimates place first quarter production figures as follows:

Cast iron soil pipe, 166,000 tons, 27 pct over the 1946 fourth quarter output; cast iron pressure pipe, 257,000 tons, up 23 pct; radiation, both cast iron and convector, 24 million sq ft, up from 21.5 million; warm air furnaces, 220,000 units, down 10 pct.

For plumbing fixtures, bathtub output rose from 357,000 to 418,000 units; lavatories dropped from 209,000 to 205,000 units; and sink production rose from 775,000 to 900,000 units.



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## NEWS OF INDUSTRY

### Development of New "D" Flange Motor Mounting Announced by NEMA

New York

••• "Development of standards for a universal flange mounting for both horizontal and vertical end-shield mounted electric motors is the latest major accomplishment by the National Electrical Manufacturers Assn., motor and generator section," according to C. P. Potter, section chairman, in announcing to the trade the new NEMA "D" flange.

Soon after the adoption of mounting dimensions for horizontal motors in 1930, the section gave its attention to the problem of standardizing the mountings for vertical shaft motors. The first standard covered a ring base having a diameter larger than the motor frame. This was NEMA "V" mounting.

To fill the desire for end-shield mounted horizontal motors, particularly for machine tool application, dimensions were worked out for a special flange, standardized as the NEMA "A" flange mounting. Later, modified as the NEMA "B" flange, it had considerable acceptance in the machine tool industry because of its smaller overall diameter.

Experience over the years with these mountings indicated the possibility of developing a single mounting which would serve for both vertical and horizontal shaft end-shield mountings and would be particularly acceptable to the machine tool industry through change from the female rabbit fit characteristic of the "B" flange standard.

To this end a joint committee of representatives from NEMA and the National Machine Tool Builders Assn. was formed to consider the standardization of motors to machine tools. This committee developed a new flange known as the NEMA "D" and established flange dimensions for motors built in frames 203 to 505, which cover ratings from 1 to 125 hp inclusive, at 1750 rpm. Five "D" flanges accommodate the spread of the 16 different NEMA standardized motor frame sizes.

This new flange has four princi-



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The Devilbiss HLC provides precise pressure regulation. A tough but exceptionally sensitive diaphragm responds to fine adjustment. Its air capacity, sufficient for two production guns, never varies. Filtered matter can't obstruct the air passage.

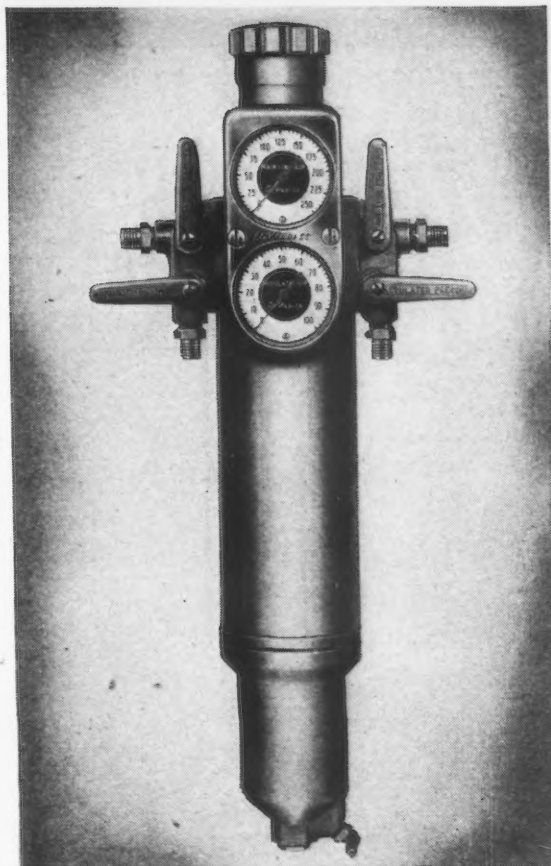
And the HLC centrifugal separators throw out all moisture and foreign matter. An automatic water drain, which requires no attention, continually discharges this moisture and residue. Mechanical metal filters assure constant filtering efficiency. There are no filter packs to become saturated and by-pass accumulated dirt. Maintenance is negligible. Plating of all parts prevents corrosion or oxidation from fumes and other compounds.

Consult Devilbiss for expert guidance whether you need air transformers or any other finishing equipment.

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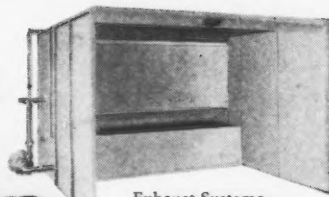


**A COMPLETE DEVILBISS LINE**

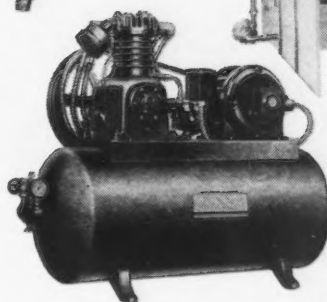
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Equipment for  
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Exhaust Systems  
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types and sizes.



Air-cooled  
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Tank Mounted  
Outfits.



Air Hose, Fluid Hose,  
and Connections for  
long useful service.

*means Quality in all four..*

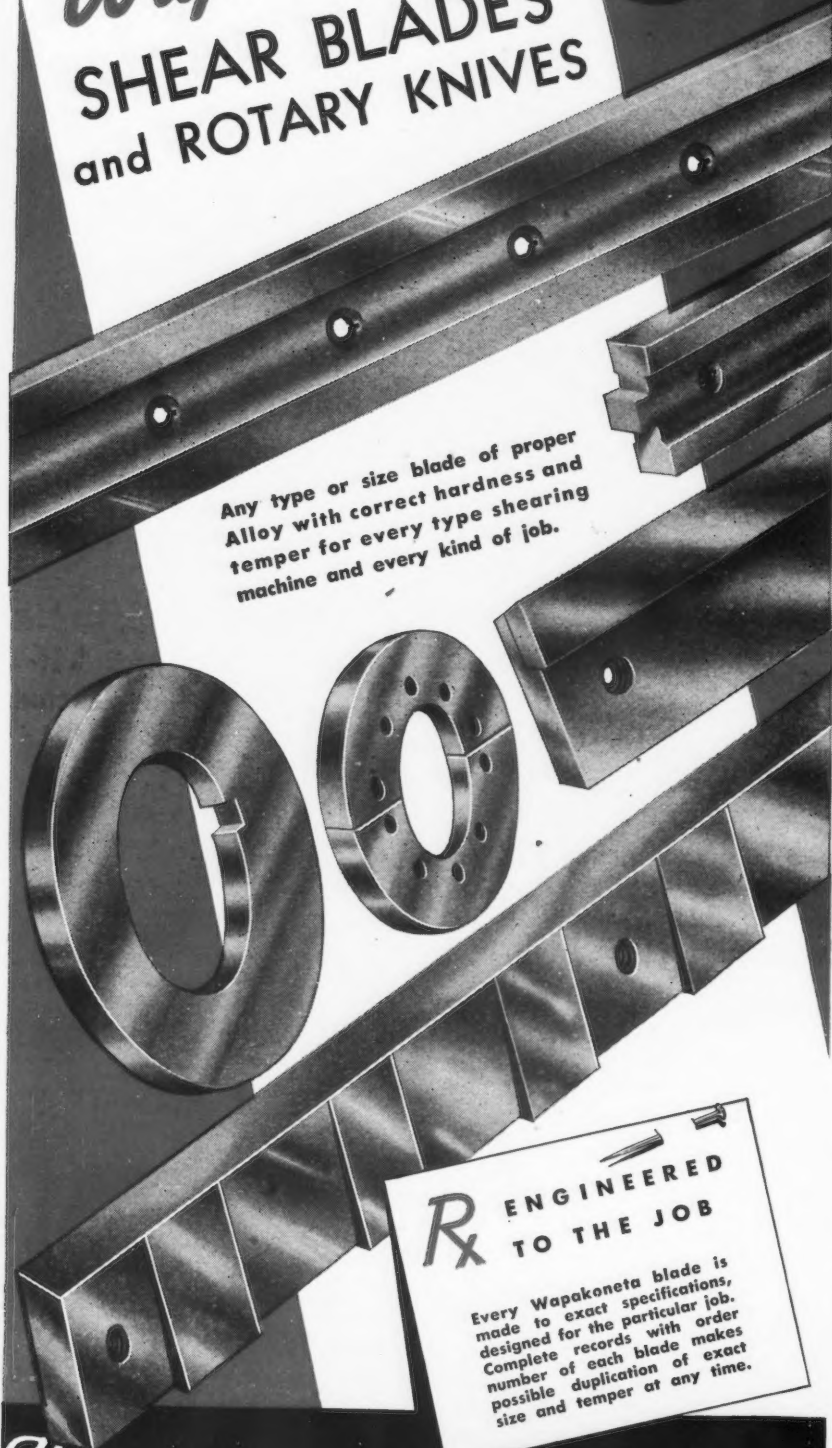
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## NEWS OF INDUSTRY

pal features, which are marked improvements.

- (1) The NEMA "D" flange has a male rabbet.
- (2) The face of the "D" flange is in line with the shaft shoulder.
- (3) The diameter of the flange is not greater than the diameter of the motor, except on frames 203 and 204.
- (4) The motor mounts on the machine from the motor side. Mounting bolts go through the flange from the motor side.

With this mounting, the only machining necessary on a machine tool or other machine frame, upon which the motor fits, covers an area equal to the diameter of the rabbet. It is not necessary to finish the larger surface needed where a female rabbet fit is used. The exact location of gears, pulleys or couplings can be predetermined regardless of what make motor will eventually be installed and no extra machining is needed to accommodate the larger shaft diameter above the shoulder.

Flanges for smaller motors have four holes for mounting bolts—those for larger motors are provided with eight holes to carry the extra weight. Motors built with NEMA "D" flanges can be had either with or without conventional motor feet.

### Thomas Steel Profit Up

Warren, Ohio

••• Thomas Steel Co. has reported net profit of \$1,066,630 for 1946, equal to about \$2.90 per common share, and double 1945 earnings and the highest for at least the last 10 years.

The company reported gross sales of \$9,035,256 and provision for estimated Federal taxes of \$677,000. Thomas Steel has started a research program in the field of specialized electroplated strip.

A \$900,000 improvement program is under way at the Warren plant, including more annealing furnaces and buildings, machine shop and additional machine tools for plant maintenance work, a new tempering furnace and an industrial relations office building. About \$500,000 of this program was completed in 1946.



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THE IRON AGE, April 17, 1947—143

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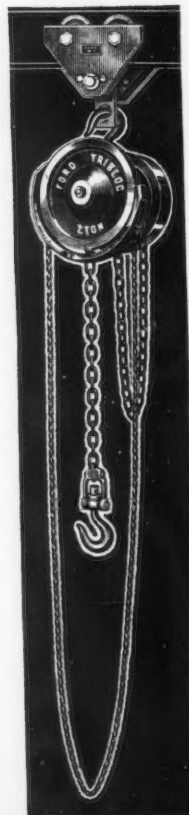
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## NEWS OF INDUSTRY

### New Plants to Increase Alcoa's Manufacturing Capacity by 20 Pct

Pittsburgh

... New plants, together with modernization of existing plants, will increase the peacetime manufacturing capacity of Aluminum Co. of America for mill and fabricated products by 20 pct. To adapt the company's facilities and services as completely as possible to peacetime market requirements, Alcoa has undertaken a balancing and improvement program.

A new sheet and plate mill is under construction at Davenport, Iowa, and is scheduled to start operations before the end of the year. A new diecasting plant is being built at Hillside, Ill., near Chicago. An extrusion plant at Cressona, Pa., which the company constructed for the government and operated during the war years, has been purchased from War Assets Administration. In addition, a plant at Richmond, Ind., not previously used for aluminum manufacture, was purchased to serve as the new headquarters and works of Aluminum Seal Co., a wholly-owned Alcoa subsidiary.

Aluminum Co. of America is confident that the present greatly expanded market for aluminum will continue, subject only to the fluctuations common to all businesses, according to the company's annual report. The nation's volume of aluminum shipments in 1946 was second only to that of iron and steel shipments in the same period.

Consolidated net income for 1946, after deducting all expenses incident to operation, taxes, depletion and depreciation, and including the refundable portion of prior years' taxes arising from unused excess profits tax credit, amounted to \$23,964,930. The comparable figure for 1945 was \$19,807,292.

Production of pig aluminum from the company's own plants increased a little more than 3 pct over 1945 production. The figures on total production of pig by the company, however, show a decrease of nearly 29 pct in 1946 when compared with 1945, due to the fact that several plants owned by the government were leased



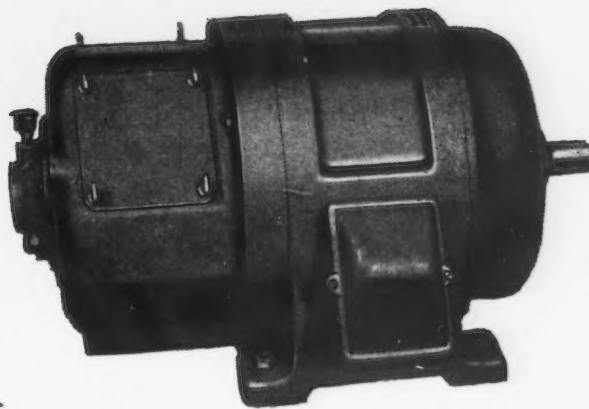
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*... Heart of Crane Dependability*



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Like *all* the electric equipment on P&H Cranes, these AC motors are designed and built by P&H specifically for crane service. They provide for high starting torque, limited starting current, and constant plugging. That's why they give you the steady, uninterrupted performance you want.

Construction is especially heavy, with more active material for greater efficiency. They are available with suitable protection for every service and atmospheric condition.

- ★ Frame is one-piece casting. Motor is built strictly to N.E.M.A. Standards.
- ★ Stator core is welded to frame . . . impossible for it to work loose.
- ★ Skewed stator slots assure improved starting and quiet operation.
- ★ Sturdy rotor has replaceable, heavy steel shaft ground to close tolerance.
- ★ All windings are heavily insulated, well braced and sealed against moisture.

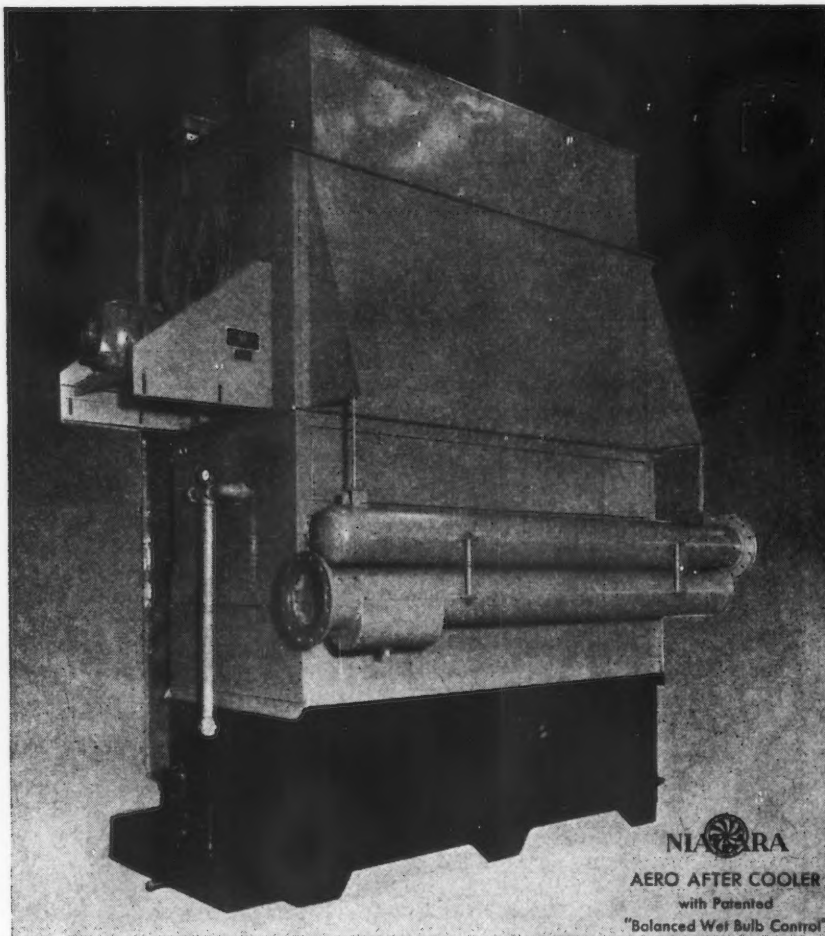
# P&H

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Protect your air tools and compressed air processes with drier compressed air . . . using the NIAGARA AERO AFTER COOLER. Based on the evaporative cooling principle, it always keep the air in compressed air lines below the relative surrounding temperature, preventing condensation and, under the least favorable conditions, provides air with one-third to one-half the moisture content of water-cooled air.

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## NEWS OF INDUSTRY

and operated by the company for a substantial part of 1945, prior to the cancellation of the leases at the end of the war.

Shipments of aluminum by Alcoa in 1946 were distributed by industries as follows:

Transportation (land, sea and air)	14 pct
Power transmission	5 pct
Cooking utensils	11 pct
Household appliances	6 pct
Building products	18 pct
Machinery (general and electrical)	6 pct
Aluminum fabricators for process-	

### Dr. George Harrison Elected Chairman Of Institute of Physics

New York

• • • Dr. George R. Harrison, dean of the school of science, Massachusetts Institute of Technology, has been elected chair-

man of the American Institute of Physics, succeeding Dr. Paul E. Klopsteg, director of research, Northwestern University Technological Institute, who has served as chairman since 1940.



DR. G. R. HARRISON

Dr. Harrison takes over leadership of the institute just as plans for a new journal of physics, long under development, are about to materialize. He is well known as a popularizer of physics, particularly for his book, "Atoms in Action."

The institute is composed of the American Physical Society, the Optical Society of America, the Acoustical Society of America, the Society of Rheology, the American Association of Physics Teachers, and has about 9,000 individual members.

Dr. Harrison is widely known for spectroscopic research and the study of atomic structure. He served for several years as president of the Optical Society of America, and has been dean of science at M.I.T. since 1942. He is editor of the journal of the Optical Society of America.



# Reports Necessity For Continued Development Work on Regenerators

Washington

••• Extensive research and development work on regenerators or heat exchangers will be necessary before gas turbines can be adapted to marine use according to a report for sale by the Office of Technical Services, U. S. Dept. of Commerce.

The report, written for the U. S. Navy Bureau of Ships, describes the preliminary results of a regenerator research program undertaken at the Naval Engineering Experiment Station, Annapolis, Md. Two additional reports on gas turbine regenerator design in Germany are also available from OTS.

Early in the gas turbine development program of the Navy Bureau of Ships, the report states, it became apparent that efficient regenerators would be required if a gas turbine plant were to have good fuel economy characteristics. The gas turbine, like the steam engine, must have an "economizer" to transfer heat from the exhaust gas to fresh compressed air. A 75-pct effective gas turbine regenerator using the conventional tubular types would require eight times as much volume as a steam power plant condenser, an amount of space not available on combat vessels. Regenerators less bulky than present type regenerators have to be devised, the report states.

Design trends by manufacturers of gas turbines, according to the report, have followed conventional practice, particularly "condenser thinking" drawn from steam-power plant experience. Because data on the requirements of gas turbine regenerators were not available, a basic research program was set up at the Naval Engineering Experiment Station.

The report describes a standard set-up for accurately determining heat transfer and flow friction data for different types of surfaces and summarizes the results of tests on various types of heat exchanger cores obtained from manufacturers.

The basic heat transfer and flow-friction data in the report are presented as the first part of a Navy program for stimulating

## "Let's Look at The Records"

A recent report contains records of MICHIANA Retorts in service in a large eastern plant for calcining paint pigments.



Retort No.	Total Hrs. To Date	Condition	Probable Total Hrs.
A-5115	8,728	Good	15,000
A-1609	13,835	Good	15,000
92279	18,089	Good	20,000
86619	26,700	Good	30,000
A-1607	12,351	Good	15,000
A-1608	12,977	Small hole	13,200

### Long Heat-Hour Service a Michiana Characteristic

MICHIANA for over a quarter of a century has proven that the uniform characteristics mean more heat-hours—and their dependability permits users to plan and expect definite performance.

From laboratory, through the hands of experienced foundrymen—to final inspection—your order is under the supervision of competent metallurgists.

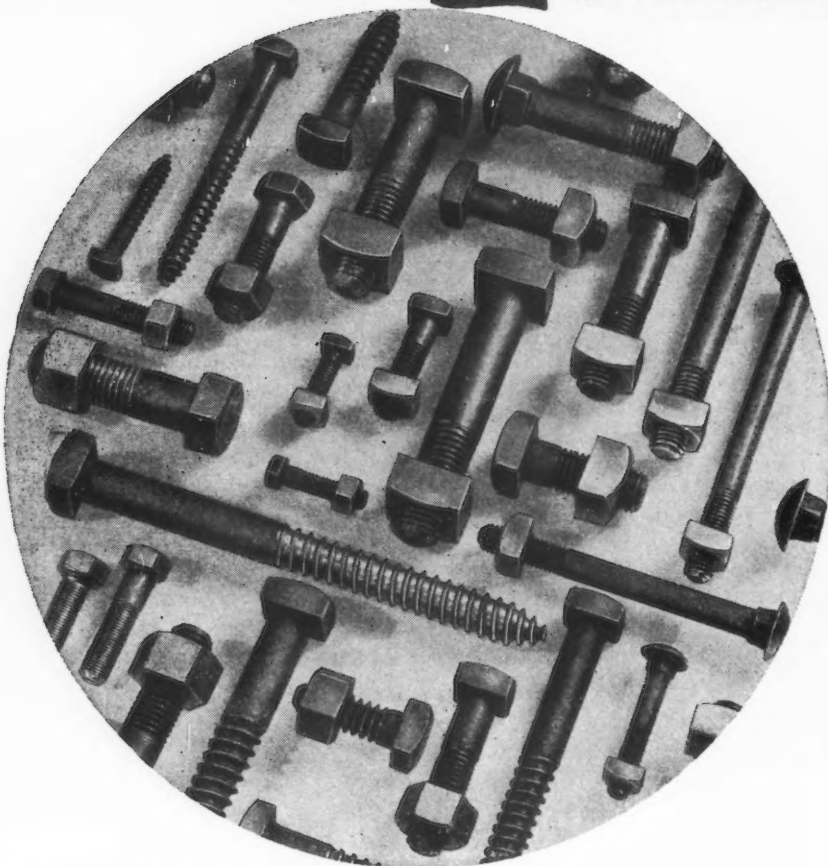
Among the many regular users of MICHIANA Alloy products are the leaders in U. S. industry—concerns that recognize the savings possible in uniformly better performance and assured long heat-hour service.

MICHIANA can meet your particular needs—in size and alloy characteristics. Now is the time to survey your requirements and prepare for steady production. Let us make recommendations and quotations. MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.



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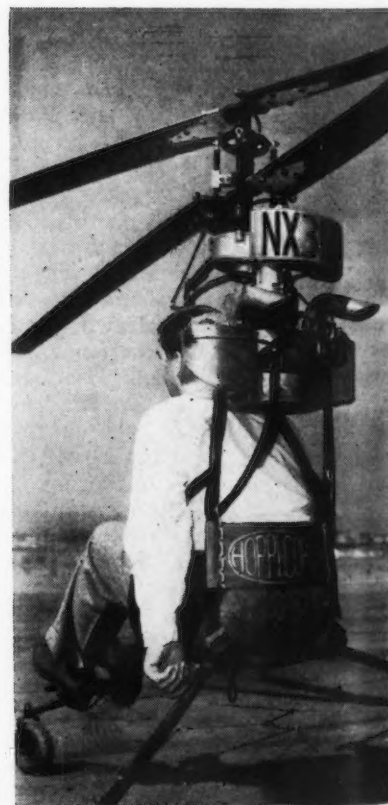
South Tenth and Muriel Sts. • Pittsburgh 3, Pa.

the development of suitable heat exchanger surfaces. The tabulated information is sufficiently accurate for preliminary design studies, the report states. The report, together with additional research data to be made available shortly, will enable reasonable design estimates to be made for the most useful variations of the plate-fin type of exchanger surface.

The research program, according to the report, also includes extensive high-temperature tests of surfaces best suited for regenerators and the building and testing of prototype regenerators for air and gas flows up to 40,000 lb per hr, corresponding approximately to the flow of a 1000 shaft-hp plant.

The overall object of the program is to determine the characteristics of present commercial heat-exchanger surfaces in order

**SHADES OF DA VINCI:** Could he but see this one man helicopter, the Renaissance inventor would chortle with glee. Its originator, Horace T. Pentecost, president of Hoppi-Copters, Seattle, recently disclosed that his new helicopter, photographed here at Seattle last summer, will have a 90 mph speed and a 12,000-ft ceiling. Specific data on actual results are not available at this time.





## NEWS OF INDUSTRY

to select those that are best suited for gas-turbine regenerators and to develop new types of surfaces to meet particular requirements.

Results of the research program will be made generally available to industry in order to stimulate and accelerate the development of compact lightweight equipment suitable for installation on shipboard, the report states. The additional basic heat transfer and flow-friction data should also prove useful in deciding whether to include regenerators in aircraft and other "high-rating" gas turbine power plants.

The German reports on gas turbine regenerator design, issued by the Joint Intelligence Objectives Agency, cover the interrogation of Herr M. Esslinger, a German scientist, by the British Aircraft Production Ministry.

The first report discusses the theoretical problem of stresses and deformations in regenerator discs and cylindrical shapes, and the second report covers the effects of heat on regenerator body discs and cylinders, sealing materials and methods used, design of regenerator bodies and their supporting casings, and the comparative effectiveness of types of regenerators.

The reports are:

PB-39554 (*Gas Turbine Plant Regenerator Surfaces, Basic Heat Transfer and Flow-Friction Data*, Navy Bureau of Ships, photostat, \$6; microfilm, \$2; 89 pages, including photographs, diagrams, and graphs).

PB-39654 (*Types of Regenerator Bodies in the Regenerator-Gas Turbine*; photostat, \$2; microfilm, \$1; 20 pages, diagrams, table, and graphs).

PB-39655 (*Design and Construction of the Regenerators of the Regenerator-Gas-Turbine*; photostat, \$2; microfilm, \$1; 27 pages, graphs, and diagrams).

Orders for the reports should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D.C., and should be accompanied by check or money order, payable to the Treasurer of the United States.



**"we proved  
our ability  
to be of  
service..."**

*says W. H. Kuelster*  
STUART OIL COMPANY  
REPRESENTATIVE

### Stuart Oil Performance Report on

## ThredKut 61

Type of product manufactured by company  
covered in this report:  
Machined parts from rough forgings

Personnel interviewed:  
Machine Shop Supt. and General Foreman  
Stuart Oil Products used in this plant:  
ThredKut 61, Solvol

Specific operations covered by this report:  
Drilling and boring forged "5060" steel pump liners

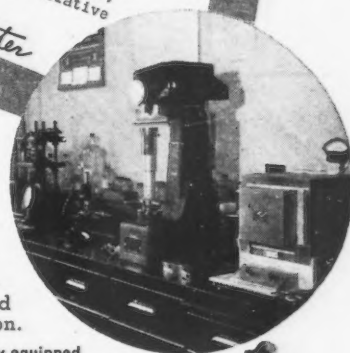
Performance details:  
"Problem was presented here in boring 7 1/2" dia. holes through 11" dia. x 30 1/2" solid forged pump liners running about 170 Br. Liners are run on two heavy duty lathes, one starting with a 1" dia. drill followed with a boring bar; the other a heavy boring bar used for removing entire 7 1/2" of stock.  
"Solvol was performing well on 4615 steel, but when 5060 steel was substituted, they could barely get 1 to 1 1/2 liners per day. From one lathe. Switching to ThredKut, tool life improved, but still only got one liner per tool grind, plus terrific vibration.  
"Then they called us in on the trouble. Our inspection of tools indicated dilution was in order. A 6-1 blend of ThredKut and Pffe. was decided upon...and it licked the job...they now turn out 3 1/2 liners per day per lathe, meeting production schedules...and are very appreciative of our help in solving this problem."  
W. H. Kuelster

HERE is another case where Stuart engineering service played an important part in solving a tough cutting problem. No "panacea" for all metal-working ills, Stuart Oil products must be used correctly to meet specific requirements. In this instance, the right oil was being used, but without necessary dilution. Our background and experience in helping to solve scores of similar problems is available to assist you in analyzing cutting fluid requirements. Write for further information.

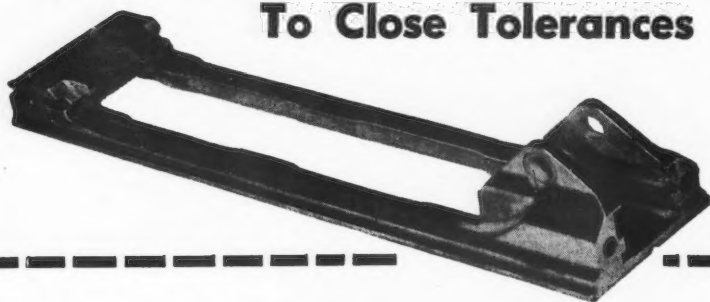
Illustrated is one section of the completely equipped Stuart Metallurgical Laboratory, where the "Straight Line to Metal-Working Efficiency" begins.

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## French Steel Output Shows Little Change Since First of Year

Paris

... French iron and steel production has remained at a stationary level since the beginning of the year. Pig iron output amounted to 361,000 metric tons in February against 404,000 tons in January, steel to 440,000 tons against 486,000 tons, and finished rolled products to 327,000 tons against 363,000 tons. But although monthly figures show a small decrease, it has to be taken into account that January allowed for three working days more than in February.

Openhearth production made some improvement: 164,000 tons in February, or 6000 tons per working day, against 168,000 tons in January, or 5400 tons per working day. This increase is the result of a better supply of scrap, conversion to oil burning, and the use of lower grades of coal in gas generators. Basic pig iron production for Thomas steel remains hampered by lack of coke.

The development of fuel oil consumption is making progress, and priority for the steel products necessary is being granted by the government. Financial provisions are thought to allow for a rapid amortization of this equipment. However, producers would like to be sure that the relation between coal costs and fuel oil costs will be maintained in future, before they embark on more conversion projects.

The insurance given by the European Coal Organization of a better supply of coal during the second quarter, with the increase of American coal exports, gives the prospect of higher French steel production. Official recommendations of the European Coal Organization are said to amount to 3,170,400 tons for the second quarter as against 2,475,600 tons for the first quarter. Steel production will get some benefit from this increase, as American coal exports are expected to be of better grades than in the past.

The future coal supply from the Ruhr is still uncertain, and as far as is known at the present time, the Moscow Conference has not brought the guarantees which are considered as of vital importance by the French iron and steel industry.

In these conditions the planning



of production programs for French industry is more and more difficult. Two basic requirements for execution of the targets proposed in the Monnet Plan for steel production are yet to be met: an adequate coal and coke supply, and financial credits. The more time elapsing before these two conditions are satisfied, the more the reconstruction and rehabilitation will be retarded, with political and social consequences in France of far-reaching effects.

It has been announced recently that the French Industrial Production Parliamentary Committee has shelved the proposed bill for nationalization of the iron and steel industry which was favored by left-wing parties. This decision brought further optimism to prospective investors who had already been favorably influenced by the announcement of an increase of prices of steel products.

### Milwaukee Foundrymen Hear Talk on Modern Aluminum Techniques

#### Milwaukee

... R. A. Quadt, research metallurgist specializing in the aluminum field for Federated Metals, spoke to foundrymen of the Milwaukee area at a recent dinner meeting of the American Foundrymen's Assn. His topic, "Common Foundry Problems in Aluminum Castings," covered modern techniques in each of three production steps: (1) Preparation of the metal in its molten condition, (2) actual casting procedure, and (3) satisfactory production of molds.

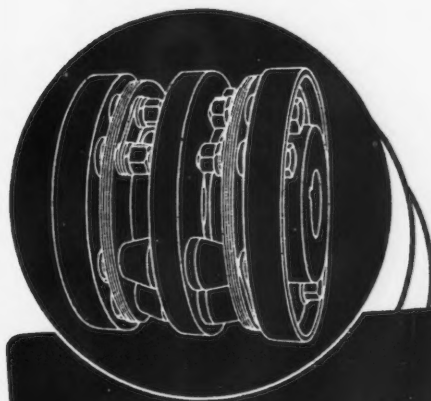
Mr. Quadt's Milwaukee presentation was arranged in view of the success of four similar presentations made by him on the West Coast in February, where over 330 West Coast foundrymen participated in the discussions.

He urged preheating to prevent gassing; discussed partial pressure phenomena of nascent hydrogen produced from moisture and hydrocarbons during melting which he said constituted the principal cause of gassing in aluminum castings; and covered the use of chlorine and dry nitrogen for flushing objectionable gases. As regards casting procedure, he presented data on the minimizing of trapped oxides and fluxes by eliminating agitation.

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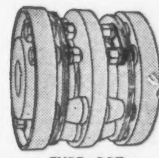
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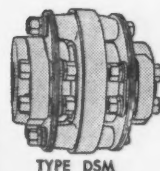
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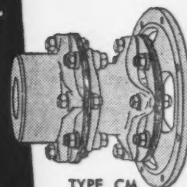
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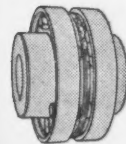
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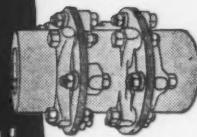
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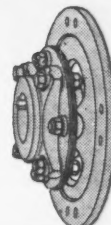
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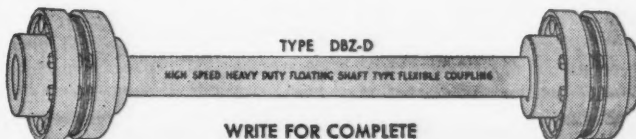
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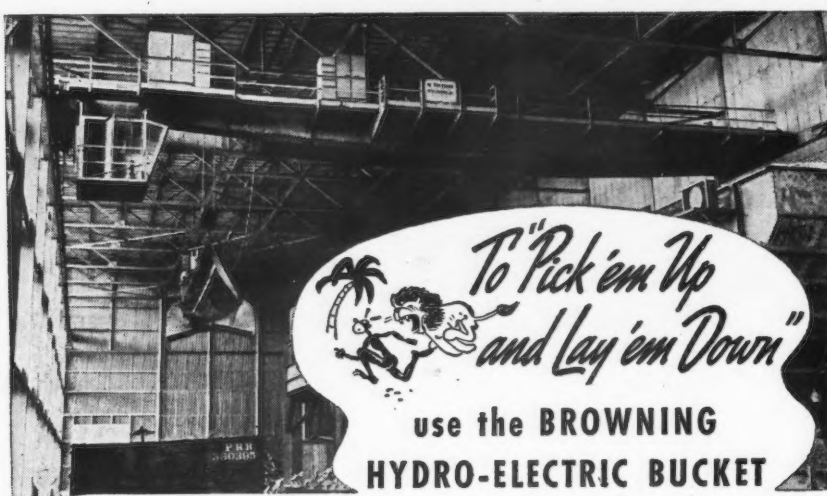
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## Merchant Ship Orders In French Dockyards Total 419,000 Tons

Paris

... Merchant shipbuilding orders in French dockyards to be delivered before the end of 1948 amount to 419,000 tons of ships of more than 1000 tons deadweight. About 370,000 tons are in private dockyards and 48,000 tons in government dockyards. Orders placed in foreign dockyards amount to 280,000 tons, but they will be limited in the future to reserve shipbuilding for the home dockyards and conserve foreign currency.

The French merchant fleet was composed in 1946 of 1,535,000 tons deadweight of ships of more than 1000 tons each. They were divided as follows according to their age: 467,000 tons of ships less than 15 years old; 350,000 tons of ships between 15 and 20 years; 322,000 tons between 20 and 25 years; 254,000 tons between 25 and 30 years; 142,000 tons of more than 30 years. To these ships were added 75 Liberty ships representing in all 540,000 tons deadweight.

At the end of 1948 the French merchant fleet should total about 2,774,000 tons, which will be scarcely sufficient for prospective needs. In addition to the tonnage on order at present in French yards, the numbers which must be replaced due to obsolescence must also be considered. In 1951 the ships more than 20 years old will need replacement. In addition, those which are listed above as more than 15 years old, that is 718,000 tons, will need replacement as soon as possible after that date. Finally, the Liberty ships must be replaced before too long by vessels which are faster and cheaper to operate.

The overall situation calls for 1.6 million tons of building in addition to those tonnages already on order. Thus the French yards appear to be assured of work for a number of years on the basis of 300,000 tons output per year. This figure does not take into account small vessels of less than 1000 tons, warships, nor repairs.

Allocations of steel for the French shipbuilding industry are insufficient for such a volume of building at present, and it is probable that they will remain low for some time. In recent months an important part of French steel imports has been



allocated to the shipbuilding industry, but import cuts due to a shortage of foreign exchange will cut off this supply. The present rate of French domestic production does not permit any sizable increase in the allocation from that source.

## French See Discussions Of Tariffs Reduced To An Exchange of Views

Paris

• • • With so much uncertainty about the near future, the discussions in Geneva on tariffs cannot be much more than an exchange of views from the French standpoint. While fully realizing the necessity of a general expansion of international trade in the future by eliminating restrictive practices and lowering duty rates, Western Europe has been so shocked that it needs first to be rehabilitated before being physically able to meet foreign competition. Especially feared is American competition.

Whereas, American producers of special and alloy steels have expressed their fear of foreign competition, arguing lower salaries in Europe, and asked maintenance of protection on their home market, European producers are looking for development of their exports in the future.

Their products are among the few which may compete with American products at the present time, and are products incorporating relatively little raw materials, but a high proportion of labor manhours, and bringing considerable foreign currency because of their high value in relation to their weight. As special steels require less fuel for their production and in many European countries hydroelectric power is available, a saving of coal imports is expected.

As far as carbon steel products are concerned, American producers expect to take full benefit of their lower costs of production at the present rate of exchange. The huge American capacity, and the prospects of surplus capacity in relation to home demand in the future is the source of additional fears.

European producers if not protected fear that American products will take root in their markets before their moderniza-



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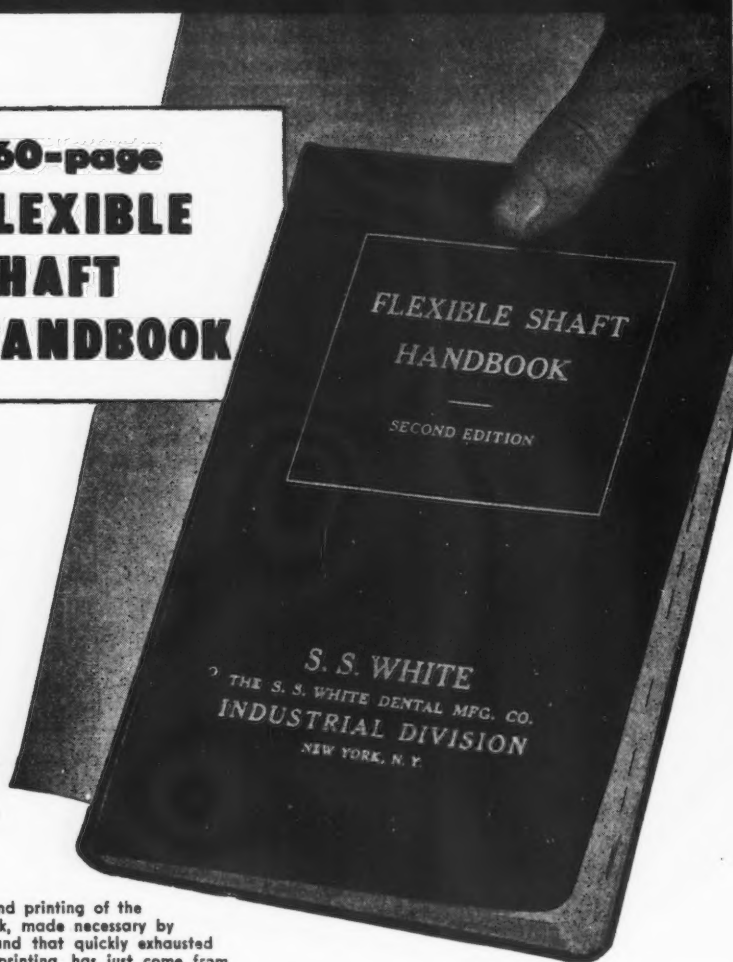
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### NEWS OF INDUSTRY

tion programs are achieved, and while they are unable to meet competition because they lack fuel and their rate of production is low.

For example, European sheet and strip markets should, in the European view, continue to be protected at least till new plans of continuous mills are achieved, otherwise their potential markets could be absorbed just at the time they should begin to operate. A transition period of 3 to 5 years or perhaps more, according to the progress of rehabilitation, is necessary before reduction of tariffs may be applied.

### Canadian Production Of Pig Iron for February Reached 150,632 Tons

Toronto

• • • Pig iron production in Canada for February amounted to 150,632 net tons, for a daily average of 5379 tons or 70.8 pct of rated capacity and compares with 177,313 tons in January when the daily average was 5720 tons or 75.3 pct of capacity, and with output of 143,171 tons in February 1946. Output for the month included 114,931 tons of basic iron, of which 113,497 tons were for further use of producing companies and 1434 tons for sale; 23,817 tons for foundry iron, 23,268 tons for sale and 549 tons for sale; 11,884 tons of malleable iron, all for sale.

Charges to blast furnaces in February included 283,691 tons of iron ore; 14,034 tons of mill cinder, scale, sinter, etc., and 4907 tons of scrap iron and steel.

Cumulative production of pig iron for January and February totaled 327,945 net tons compared with 286,856 tons in the like period of 1946 and 305,456 tons in 1945.

Output of ferroalloys in February amounted to 9357 net tons, compared with 9644 tons in January and 10,872 tons in February last year. The month's output included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus. For the first 2 months of this year production of ferroalloys totaled 19,001 tons against 21,750 tons in 1946 and 25,532 tons in 1945.



## Weekly Gallup Polls

(Continued from page 107)

—the Democratic or Republican—can better handle the problem of keeping wages high?"

The replies:

	Pct
Believe Republicans can handle problems better	22
Believe Democrats can handle problems better	54
Makes no difference	24

One in ten questioned in the poll had no opinion.

Sentiment as shown in the above table is, moreover, fairly stable. When the same question was asked about 9 months ago, the replies were substantially the same, except that slightly more named the Republicans than than is the case today.

Other polls in the past have found that the voters believe the Democratic Party is best for people of below average income, while the Republicans are the party which look after the interests of the more well-to-do.

While many Republican leaders would undoubtedly say that the public has an erroneous impression of the GOP and that the party is well able to look out for the interests of the working man, nevertheless the public's impression forms a distinct handicap to the Republicans in seeking votes among the masses of population in the big cities.

The problem facing the GOP in 1948 was illumined by the outcome of the Chicago mayoralty election. The strong Democratic vote cast there would suggest that the Republicans face anything but a picnic in 1948 in the big cities.

••• A number of U. S. Senators have decided that the ancient Senate prerogative of "talking a bill to death" ought to be ended.

Two bills have been introduced in the Senate to make it a lot harder to carry on filibustering, last used by Southern Senators in the fight to seat Theodore Bilbo, of Mississippi, at the opening of the Eightieth Congress.

A substantial majority of American voters who know what the term "filibuster" means say they think Congress should do something about filibusters. Five



This interesting print from an old copperplate shows what is said to be the first stamping mill powered by steam, designed by Branca in 1629.

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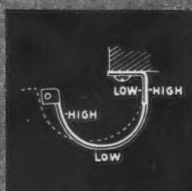
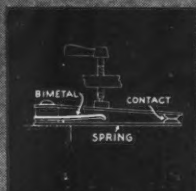
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156—THE IRON AGE, April 17, 1947

## NEWS OF INDUSTRY

out of ten gave what was considered an acceptable definition.

At the present time, if Senators want to stop a colleague from talking on and on to prevent passage of a bill he doesn't like, they have to muster two-thirds of the Senators to their way of thinking.

In the past, this has proved an extremely difficult job. During the past 20 years, Senators eager to clamp down on a colleague have succeeded in getting the necessary two-thirds only four times.

A majority among the same group approve the idea of having the Senate change its rules so that a simple majority can call for an end to discussion instead of a two-thirds majority as is now the case.

Democrats and Republicans alike think something ought to be done about the filibuster and approve the simple majority change. Moreover, among voters interviewed in the 13 states of the South a majority think a more effective limit should be placed on how long a man can talk in the Senate, in spite of the fact that Southern Senators have in recent years used the device with dramatic effectiveness as an obstructionist tactic.

In measuring sentiment toward the controversial issue, the institute asked the following questions:

(1) "Can you tell me what the term 'filibuster' in Congress means to you?"

The replies:

	Pct
Correct answer	48
Don't know, incorrect	52

The following questions were limited to those who gave a correct reply to the first question:

(2) "Do you think Congress should do something about filibusters?"

	Pct
Yes	78
No	13
No opinion	9

(3) "It has been suggested that the Senate change its rules so that a simple majority can call for an end to discussion instead of a two-thirds majority as is now the case? Do you approve or disapprove of this?"

	Pct
Approve	57
Disapprove	30
No opinion	13

The question is one that transcends partisan thinking. This is shown when replies are broken down to show how Republican



NEWS OF INDUSTRY

and Democratic voters feel about the issue:

	Dems. Pct	Reps. Pct
Approve .....	58	57
Disapprove .....	29	31
No opinion .....	13	12

Opinion among voters surveyed in the South familiar with the term filibuster is substantially the same as that throughout the rest of the country, with a majority favoring an end to the two-thirds rule.

The London Economist


(CONTINUED FROM PAGE 111)

but it also contains Western agrarian radicals devoted to the enforcement of competition.

In spite of protests by the Dept. of Justice, an effort is being made to pass a law under which rate conferences organized by railways and road haulage lines may be registered with the Interstate Commerce Commission and may operate under its approval. A similar bill was favorably reported from committee in the last Congress, but failed to pass.

Among the many labor bills now under consideration are several which propose to make the antitrust laws applicable to restrictive practices by labor unions, as was the case until unions were granted immunity by the Court's interpretation of some of the New Deal labor laws.

Off-setting these proposals from the conservative side is a bill by a Republican Senator from Oregon which seeks to tighten the antitrust laws. It would specifically prohibit participation in international cartels. It would require registration of patent license agreements and would prevent them from containing restrictions about price, quantity, or field of business activity. It would increase appropriations for enforcement of the antitrust laws and would impose heavier penalties upon those who violate these laws. It would also provide for annual public reports by the President about the extent of monopolistic practices, for directives by him designed to coordinate the attack




No. 4 in a series

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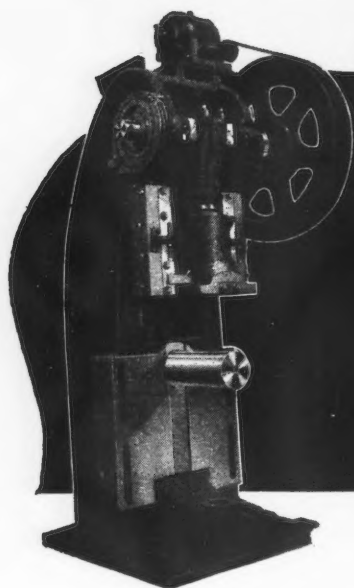
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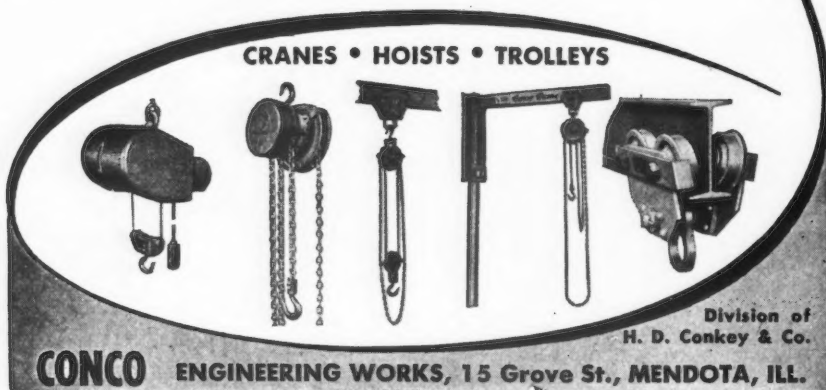
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## NEWS OF INDUSTRY

upon monopoly throughout the federal government, and for supplementary devices, such as easier credit for small business and modification of freight rate structures, which might foster competition.

That such divergent tendencies express no serious disagreement about the basic philosophy of the antitrust laws is evident in the fact that there is general agreement in support of the portions of the draft charter of the International Trade Organization which are designed to curb international cartels. Both parties take this part of the charter for granted.

Leading business groups have endorsed the proposal, though some of them apparently hope that a way can be found to use the looser provisions of the international charter as a means of relaxing the domestic antitrust laws. Newspaper and political comment has been generally favorable, with occasional criticism on the ground that the charter is not strong enough.

## To Sell Electrical Supplies

Chicago

• • • Two million dollars worth of electrical supplies to be sold at cost will take place in a spot bid sale at the Signal Corps Depot in Chicago, Apr. 16, 17 and 18. The sale is open to normal channels of trade without priorities. The depot will be open for inspection of materials from 9 to 5 on Apr. 14 and 15.

Among the items are portable generating units of various types, including gasoline driven dc sets, 32 v, 250 w, used for charging batteries. A quantity of repair parts for generating sets will be available. There is a good supply of pole line hardware and materials for constructing power lines. In addition there is a limited quantity of cable and wire suitable for building leads into buildings from power lines. Miscellaneous electrical supplies such as rectifiers, knife switches, battery chargers, electric bells, fuses, voltage regulators and terminal strips will also be up for sale.



## Administration Seeks To Set Aside National Machine Tool Reserve

Chicago

• • • For almost 2 years, the machine tool advisory committee has recommended a government pool of 65,000 machine tools to be set aside and held in case of emergency. The Machinery Dealers National Assn. has been trying to get the services to take action and earmark the necessary machines so that they might be held in proper type of storage warehouses. Up until a few weeks ago, according to the association, there has been practically nothing done about this program.

The association now reports that because of the serious nature of political differences with which our country is faced, the Administration has finally awakened to the point that they are insisting that immediate action be taken. The Administration is now proposing to Congress that additional legislation be passed, authorizing a national strategic reserve of 250,000 machine tools to be earmarked for national defense.

Harvey H. Goldman, president of MDNA, states that it is the association's opinion that there will be great reluctance to okay such a large program unless the national situation becomes more threatening.

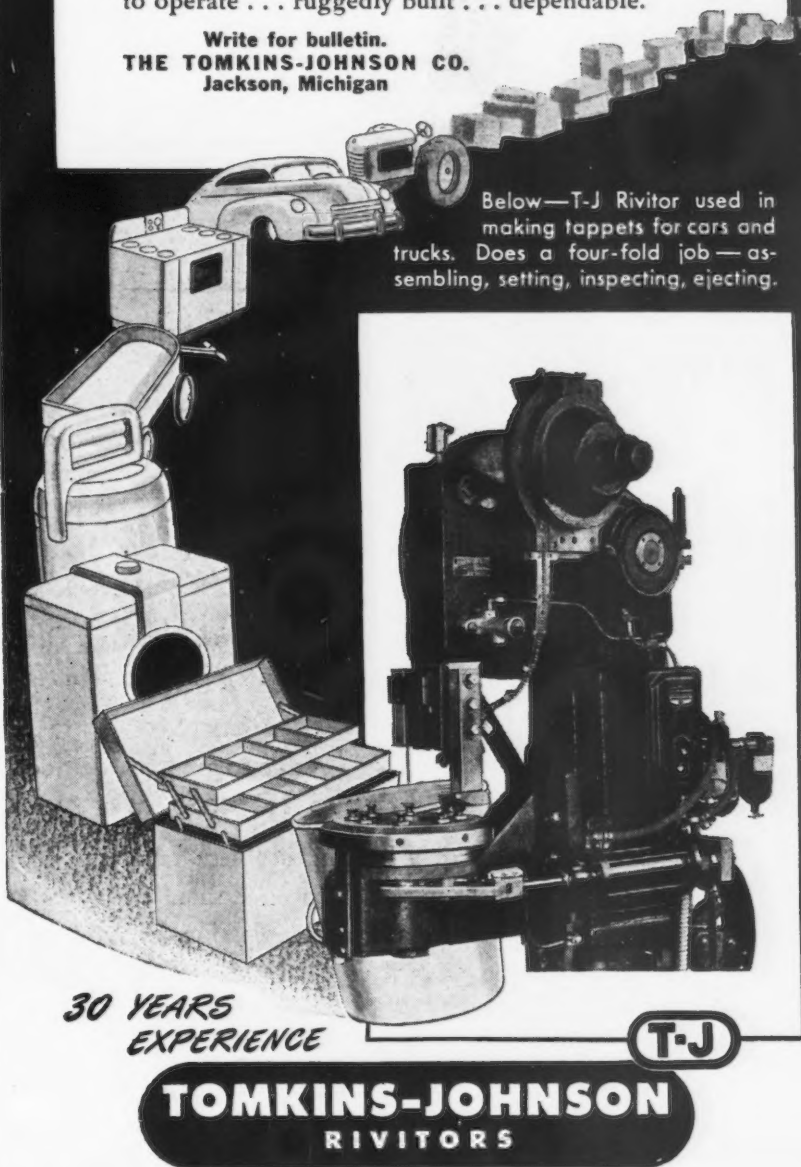
In conclusion, the president of the association states that the machine tool industry will be affected in four ways, (1) War Assets activity will decrease, because of the freezing of a great percentage of standard general purpose machine tools; (2) with the removal of the pressure of competition with WAA, it will be possible for machinery dealers to get back on a more normal businesslike basis; (3) it is felt that the value of good sound machine tools will rise because there will not be the large supply of equipment hanging over the market which had a tendency to depress prices; (4) it is not believed there will be any further change in WAA pricing schedules in the immediate future.

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